

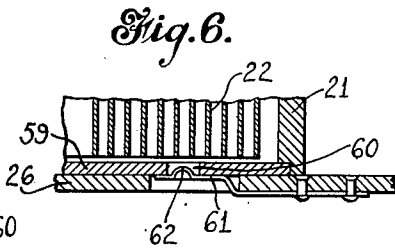
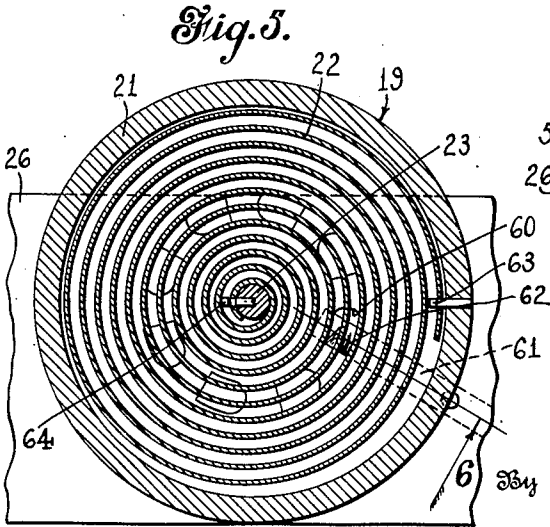
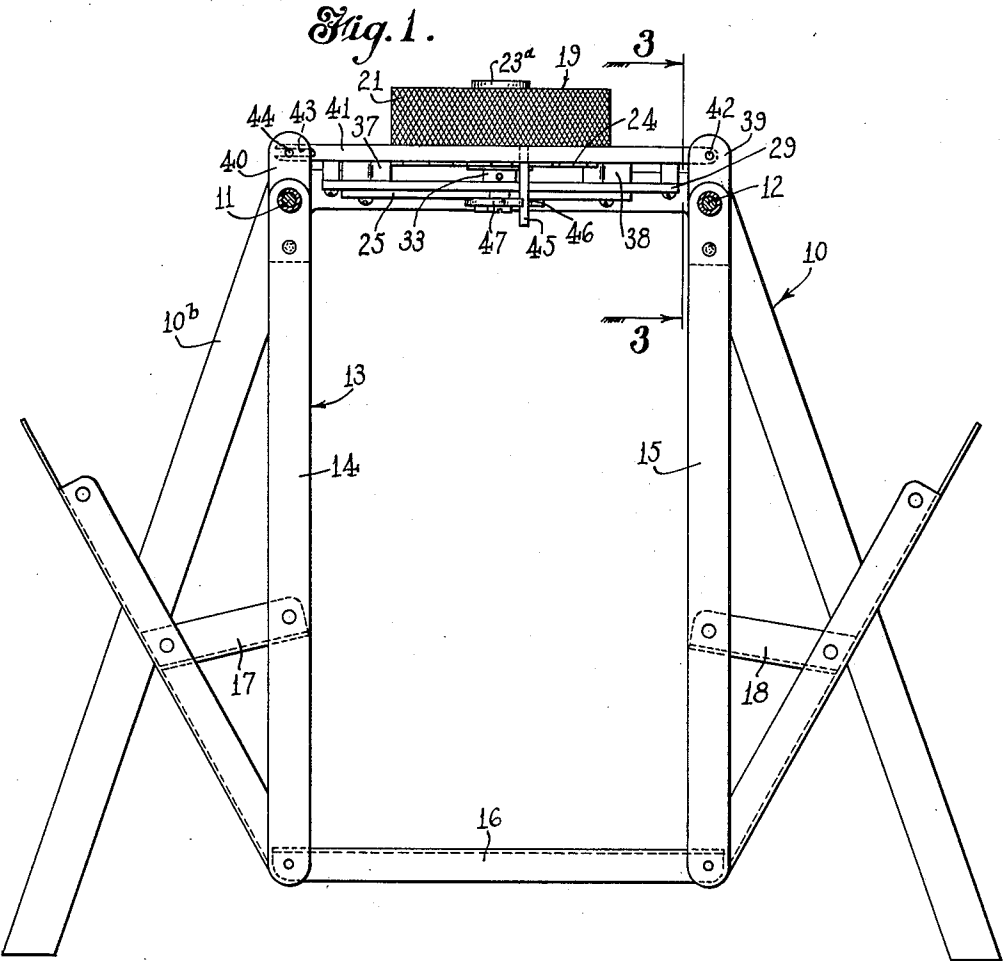
June 26, 1951

A. ESPARI  
TOY SWING

2,558,045

Filed Dec. 31, 1945

3 Sheets-Sheet 1



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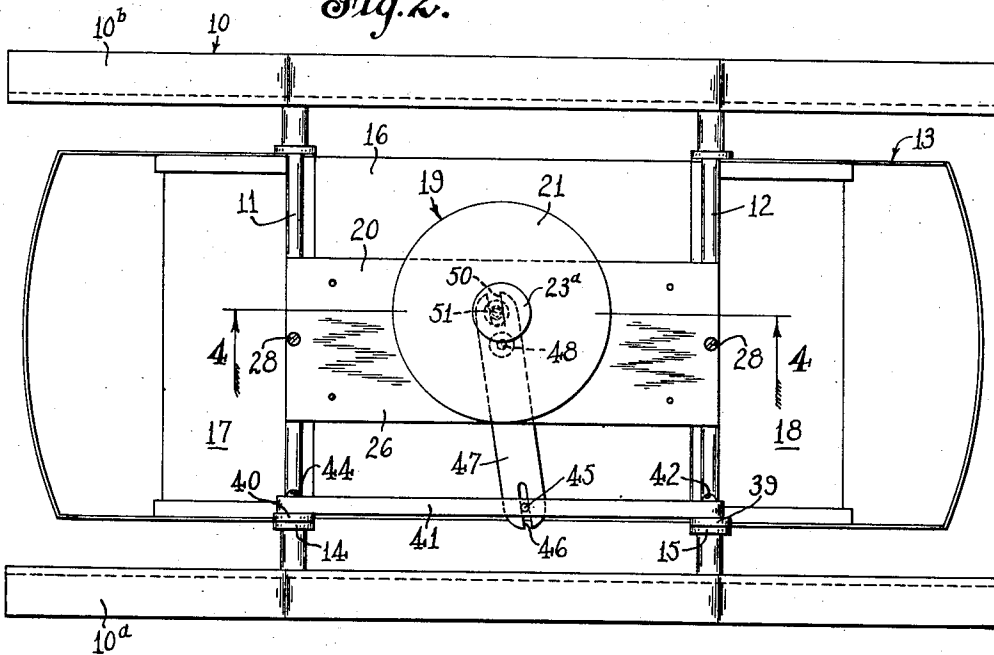
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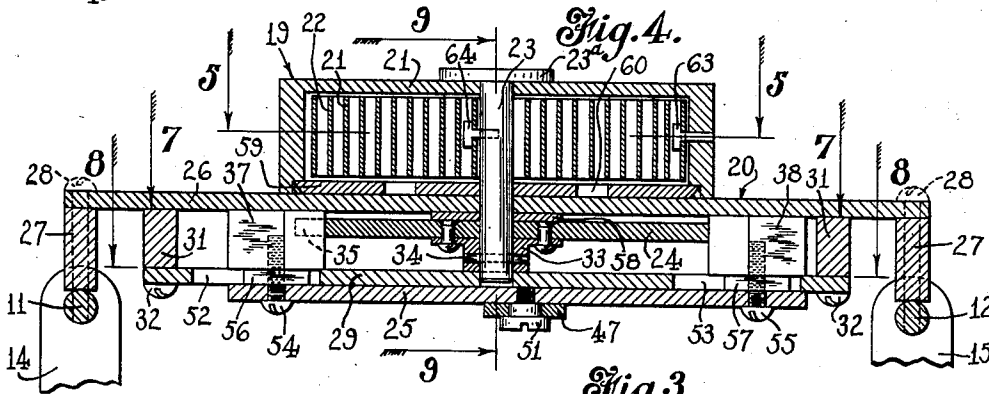
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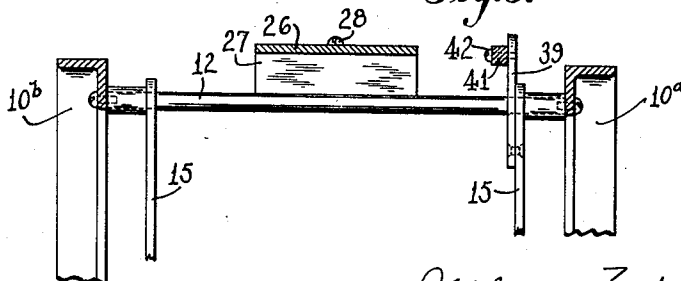
*Fig. 2.*



*Fig. 4.*



*Fig. 3.*



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Fig. 7.

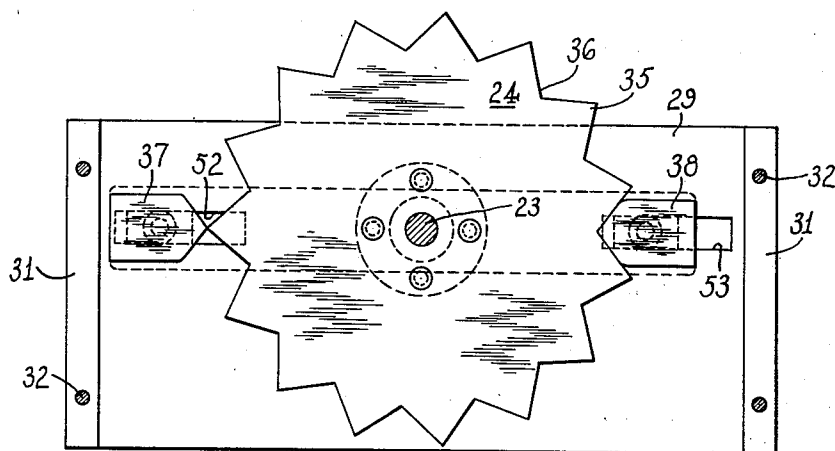


Fig. 8.

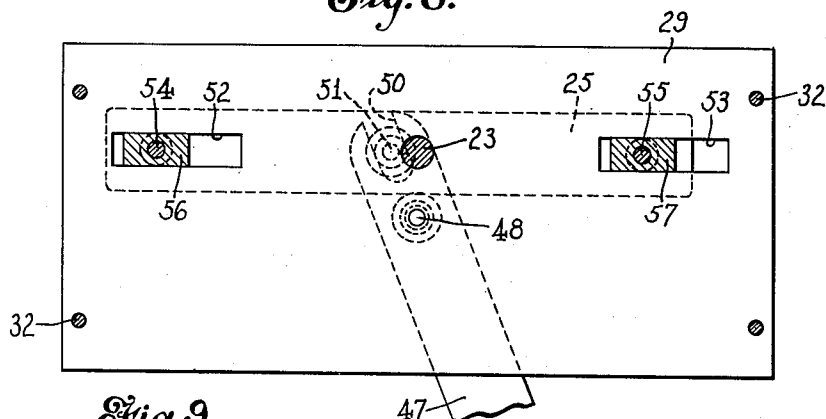
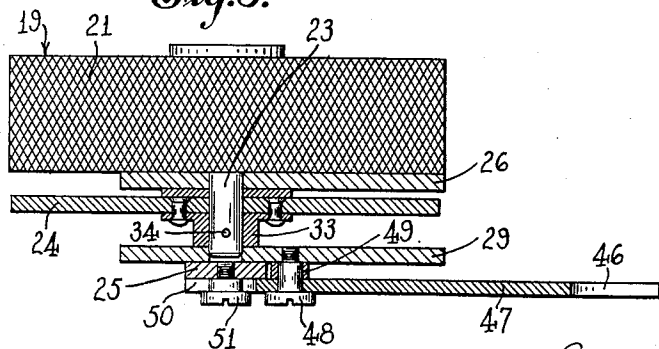


Fig. 9.



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## UNITED STATES PATENT OFFICE

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## TOY SWING

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Application December 31, 1945, Serial No. 638,556

8 Claims. (Cl. 155—59)

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This invention relates to toy swings, and more particularly to those in which a spring motor is used for imparting motion to the moving element of the swing.

One of the objects of the invention is to provide an attractive toy in which movement will be imparted to the swinging member for a considerable length of time before it is necessary to rewind the spring motor.

Another object is to provide an improved arrangement of elements in a device of this kind with a view to providing a device which is durable and will not easily get out of order and will give satisfactory service to the user.

In the accompanying drawings:

Fig. 1 is a side view of a device embodying the invention, the frame being broken away to omit the side frame toward the observer;

Fig. 2 is a top plan view of the toy swing;

Fig. 3 is a section on line 3—3 of Fig. 1;

Fig. 4 is a section on line 4—4 of Fig. 2;

Fig. 5 is a section on line 5—5 of Fig. 4;

Fig. 6 is a detail section taken on a line indicated by arrow 6 on Fig. 5;

Figs. 7 and 8 are, respectively, sections on lines 1—1 and 8—8 of Fig. 4; and

Fig. 9 is a section on line 9—9 of Fig. 4.

In the form shown in the drawings, the device comprises a swing having a stationary frame or standard, including side frames adapted to rest on the ground or on a floor, and a swinging element comprising pairs of swinging bars or arms interconnected at their lower ends by a floor or foot rest, each pair of bars carrying a seat. The pairs of bars are adapted to swing on axes provided by crossbars interconnecting the top portions of the side frames. Supported on top of the crossbars is the base portion of a spring motor, said motor including a spring casing disposed at the upper part of the swing where it is readily accessible for winding. The spring motor has an escapement element of novel form, and this element is connected by novel means with the swinging element of the swing in the manner hereinafter more particularly described, so that, when the oscillation of the swinging member is started, it will be continued for some time, that is to say, until the coil spring in the motor is substantially unwound or de-energized.

In this form, the escapement element of the spring motor acts upon a lever pivoted intermediate of its ends to swing in a substantially horizontal plane, one end of said lever being connected to the escapement element to be actuated thereby, and the other end of the lever being connected to a reciprocating bar interconnecting the two pairs of seat-supporting bars.

In the drawings, the stationary frame 10 of the swing comprises the side frames 10<sup>a</sup> and 10<sup>b</sup> interconnected at their upper ends by the crossrods 11, 12. These crossrods act as supports for

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the swinging element 13 of the swing. This element comprises a pair of bars 14 and a pair of bars 15, said bars being interconnected in the usual manner by a foot rest 16. The pairs of bars also have associated therewith seats 17 and 18. All of the parts mentioned to this point are preferably made of metal, and the swing shown is one constructed of metal.

The spring motor is generally indicated at 19, and the same comprises a rectangular base portion 20 set over and secured to the crossrods 11, 12, and it further comprises an upper spring case 21 in which is disposed a spring 22 in the form of a pancake spiral. An arbor 23 is disposed partially within the spring case and partially within the base portion 20 of the motor, which base portion is made hollow and encloses an escapement wheel 24, with which wheel a sliding escapement member or bar 25 is associated.

Referring now to the details of the motor and escapement mechanism, it will be noted that the base 20 of the motor includes a top plate 26. The ends of the plate 26 are spaced upwardly from the crossrods 11 and 12 by spacer members 27, and in this form screws 28 extending through the end portions of the plate and through the spacer members attach the plate to the crossrods. A plate 29 is parallel to the plate 26 and provides an enclosed space beneath plate 26 in which the escapement wheel 24 is received. The lower end of the arbor 23 extends into a hole in plate 29. The end portions of the plate 29 are spaced from plate 26 by spacers 31, and screws 32 pass through the plate 29 and through the spacers so as to secure the lower plate to the upper plate.

The escapement wheel 24 is riveted to a hub 33, and this hub is fixed to the arbor 23 by means such as a crosspin 34. The escapement wheel has a plurality of teeth 35 with inclined side surfaces, the arrangement being such that between any two adjacent teeth is a V-shaped space 36, the side boundaries of which create and define between them an angle of 120°. These interdental spaces of the escapement wheel are adapted to be engaged by the pallets or pawls 37, 38 of the sliding escapement bar 25.

Referring to Figs. 2 and 3, it will be noted that one of the bars 15 is provided with an extension 39 which projects upwardly above the adjacent crossbar so as to provide a swinging bar oscillating about an axis somewhat below its upper extremity, and it will be noted that bar 14 at the same side of the swing is provided with a similar upward extension 40. These extensions 39 and 40 are interconnected at their upper parts by an element adapted to move longitudinally of the swing and constituted in this case by a bar 41. This bar receives motion from the spring motor in the manner to be described later on, and when reciprocated causes oscillation of the movable swing element. In the form shown the bar 41 is pivoted

at one end to the extension 39 by means such as a screw 42, and at the opposite end it is formed with a slot 43 engaging a pin 44 carried by the other extension, so that that end of the bar is supported for the generally reciprocating movement of the bar which takes place in the operation of the device.

The connecting bar carries intermediate of its ends a fixed downwardly extending pin 45, and this pin is engaged in a notch 46 in one end of a lever 47 that is actuated from the spring motor to oscillate in a horizontal plane. The lever 47 is fixed with relation to the spring motor by being pivoted intermediate of its ends on the bottom plate 29 of the motor base. The lever 47 is spaced downwardly somewhat from the plate 29, and is pivoted to said plate by means such as a screw 48 screwed into a socket in the plate 29, the lever 47 being spaced from the plate 29 by an intervening sleeve 49, as shown in Fig. 9. At the end opposite the slot 43, the lever 47 has a second slot 50, and this slot 50 is engaged by the body of a member such as a screw 51 disposed beneath the escapement bar 25 and having a threaded shank engaged with a threaded socket in the escapement bar, as shown in Fig. 9. The pivot or fulcrum 48 of the lever 47 is located much nearer the screw 51 than it is with reference to the pin 45, the consequence being that that arm of the swing-operating lever which is moved from the spring motor, as hereinafter described, has considerably less movement than the arm of the lever which actuates the connecting bar.

It will be observed that in the form shown the sliding escapement bar 25 with its pallets or pawls is made up of separate pieces suitably interconnected, although this is not necessary in all cases. In the form shown, the pallets 37 and 38 are formed as separate blocks having opposing V-shaped faces adapted to fit the spaces between the teeth of the escapement wheel, said blocks having lower surfaces adapted to slide against the upper surface of plate 29, and upper surfaces adapted to slide against the lower surface of plate 26. The plate 29 is provided adjacent the respective ends with slots 52 and 53, which are overlain by the respective pallets, the pallets being connected to the escapement bar by screws 54 and 55, respectively, which screws pass through guide portions 56 and 57, respectively, that are formed on the pallets and located in the slots 52 and 53. The guide portions fit the respective slots, and it will be noted that by this arrangement the member 25 is guided rectilinearly in a precise manner so that the pallets will engage the escapement wheel properly.

The escapement wheel is spaced downwardly somewhat from the plate 26 by means of a spacer 58.

The spring case 21, previously mentioned, has a main portion formed as an inverted cup, and it has a separate bottom member 59 which rests on the plate 26. This bottom member is provided with a series of apertures 60, and these apertures are adapted to be engaged serially by a spring finger 61. The finger 61 has a projection 62 adapted to be engaged in any one of the apertures 60 for the purpose of holding the spring case against unwinding movement. The spring finger 61 may be fastened to the plate 26 by rivets, as shown in Fig. 6. It is understood, of course, that the bottom member 59 is suitably fixed to the body of the spring case. The spring case has a side wall which is preferably knurled exteriorly, as shown in the drawings, so that the

case can be grasped by the fingers for turning it, and thereby winding up the spring, and as the case is turned the case bottom 59 moves with it and the engagement of the spring finger with the apertures or recesses in the case bottom prevents retrograde movement. At its outer end the spiral spring is made fast to the case as by employing a fastening member 63 engaged with the side wall of the case, as shown in Fig. 4. The inner end of the spring is fastened to the arbor 23 by the use of a fastening member 64 or other fastening means. At the top of the arbor 23 is a cap member 23<sup>a</sup> overlying the upper wall of the case and preventing dislocation of the case in an upward direction. The arbor is restrained from upward dislocation by the attached escapement wheel which is situated beneath the plate 26 in the location previously described.

It is believed that the operation of the device will be obviously for the most part from the foregoing description. The outer and longer arm of the lever 47 associated with the swing element is oscillated by the escapement bar 25, and through the pin 45 transmits movement in opposite directions to the member 41 and to the extension 39 of one swinging bar 15 so as to cause the oscillation of the swinging element of the swing. While the member 41 has a generally reciprocating movement, it also has a slight up and down movement as the result of the described mounting, and it can move up and down as required because of the engagement of its pin in the slot of the actuating arm. The spiral spring constantly exerts torque on the motor arbor, tending to rotate the escapement wheel in the same direction, and the escapement wheel exerts pressure against one of the pallets, but is restrained from movement by this pallet. The pallet eventually disengages and releases the wheel, however, permitting turning thereof until the other pallet comes into full engagement with and arrests the wheel, these movements causing the movement of the escapement bar under the influence of the swinging member or pendulum. By the described construction it is possible to provide a toy swing in which the spring motor will cause oscillation of the pendulum element for a considerable interval of time before the re-winding of the motor is required.

The invention also provides an attractive toy which is of compact and durable construction. The means intermediate the spiral spring and the pendulum element, which causes oscillation to be imparted to the pendulum element, is simple and substantial and operates in a satisfactory manner.

It is understood that in the drawings only one form of the device is shown, and that various changes can be made in the arrangement of parts and in the structural details within the principles of the invention and the scope of the claims.

What I claim is:

1. A toy swing comprising a stationary frame having side frames and upper crossbars, a swinging element having suspension bars pivoted by means of said crossbars, at least one of said suspension bars being extended upwardly beyond its pivot, a spring motor mounted on top of the frame and having a spring at the upper part and having an escapement wheel and a moving escapement member at the lower part, and means of connection between said escapement member and the upwardly extended portion of the suspension bar, said escapement member being a

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horizontally sliding member, and said means of connection including a lever having a fulcrum between its ends.

2. A toy swing comprising a stationary frame having side frames and upper crossbars, a swinging element having suspension bars pivoted by means of said crossbars, at least one of said suspension bars being extended upwardly beyond its pivot, a spring motor mounted on top of the frame and having a spring at the upper part and having an escapement wheel and a moving escapement member at the lower part, and means of connection between said escapement member and the upwardly extended portion of the suspension bar, said escapement member being engageable with and sliding horizontally of the escapement wheel, and said means of connection with the swinging element including a lever having a fulcrum between its ends, said lever being connected at one end to the escapement member and being connected at the other end to a reciprocating member connected to the swinging element.

3. In a toy swing, the combination of a stationary frame having side frames and upper crossbars, a swinging element having suspension bars suspended by said crossbars, at least one of said suspension bars being continued upwardly beyond its oscillating center, a motor device having an upper spring case and having a lower base portion, said base portion being fixed to the upper part of the frame so that the spring case is above and between the crossbars, the base portion being hollow and the motor device having an escapement wheel and a horizontally and longitudinally sliding escapement member engageable therewith which moves radially of the escapement wheel located at least in part within the base portion, and means for operatively connecting the escapement member with the upwardly extended portion of the suspension bar.

4. In a toy swing, the combination of a stationary frame having side frames and upper crossbars, a swinging element having suspension bars suspended by said crossbars, at least one of said suspension bars being continued upwardly beyond its oscillating center, a motor device having an upper spring case and having a lower base portion, said base portion being fixed to the upper part of the frame, the base portion being hollow and the motor device having a horizontally sliding escapement member located at least in part within the base portion, and means for operatively connecting the escapement member with the upwardly extended portion of the suspension bar, the motor device also including an escapement wheel located within the base portion, the escapement wheel having its periphery formed to present V-shaped notches or interdental spaces, and the sliding escapement member having pallets with V-shaped faces adapted to fit into said spaces and move radially toward and away from the center of the escapement wheel.

5. In a toy swing, the combination of stationary frames having side frames and upper crossbars, a swinging element suspended by said crossbars, a spring motor having a base superimposed on the crossbars and attached thereto and having a round exteriorly knurled and upwardly extending spring case between the crossbars containing a motor spring adapted to be wound by turning of the case in a horizontal plane with the fingers, said spring motor having an escapement wheel

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and a radially and horizontally sliding escapement member engageable therewith, and means for connecting said escapement member with the swinging element.

6. In a toy swing, the combination of stationary frames having side frames and upper crossbars, a swinging element suspended by said crossbars, a spring motor having a base superimposed on the crossbars and attached thereto and having an upwardly extending spring case exteriorly knurled and containing a motor spring adapted to be wound by turning of the case, said spring motor having an escapement wheel and a movable escapement member, and means for connecting said escapement member with the swinging element, the escapement member being a horizontally sliding member associated with the base of the motor and the connection between the swinging element and the motor including a fulcrumed lever operated by said escapement member and moving in a horizontal plane.

7. In a toy swing, the combination of a frame having upper crossbars, a swinging element having suspension bars suspended by said crossbars, a motor device for causing swinging movement of the swinging element having a spring case and a lower base portion supporting the spring case, said base portion being hollow and having end portions supported by the crossbars, the hollow base portion comprising upper and lower plates spaced from each other, said motor device having an escapement wheel and a sliding escapement bar guided between said plates in a direction transversely to the crossbars and radially of the escapement wheel, and operative means of connection between said escapement bar and said swinging element whereby the motion of the escapement bar is transmitted to the swinging element.

8. A toy swing comprising a stationary frame having side frames and upper crossbars, a swinging element having suspension bars pivoted by means of said crossbars, said suspension bars being extended upwardly beyond their pivots and said extensions being interconnected by a bar adapted to move longitudinally of the swing, a spring motor supported on top of the frame and having a spring at the upper part intermediate the crossbars and an escapement wheel and a horizontally sliding escapement member at the lower part, and means of connection between said escapement member and the bar interconnecting the suspension bars, said means being a lever fulcrumed intermediate its ends to the motor support, one end of the lever having a sliding pivotal connection with the escapement member and the other end of the lever having a sliding pivotal connection with the intermediate part of the bar connecting the extensions of the suspension bars.

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