Jan. 8, 1946. L. H. BURLIN 2,392,721

TIGHT-ROPE WALKING TOY

Filed May 14, 1945

Fig. 1

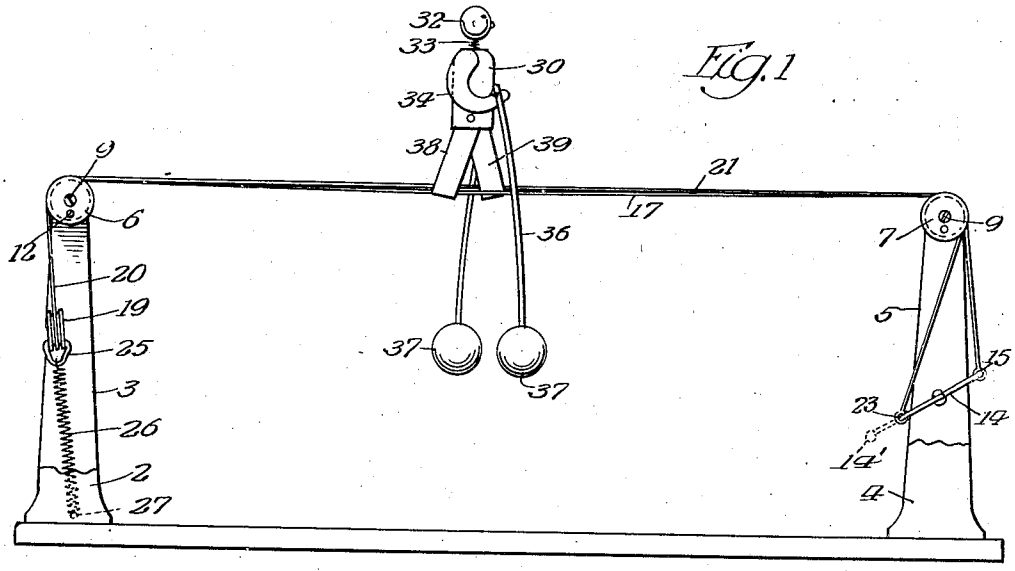


Fig. 2

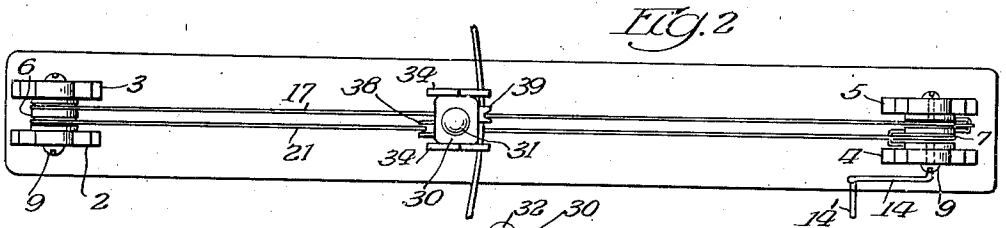


Fig. 3

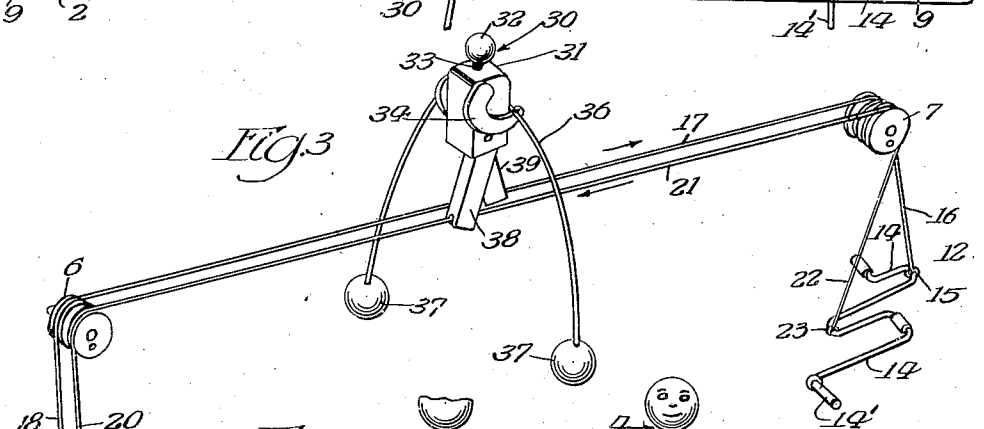


Fig. 4

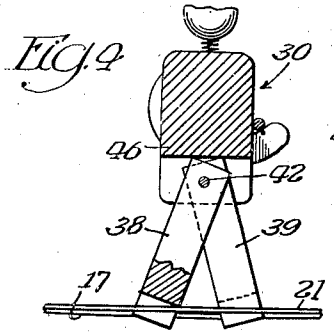
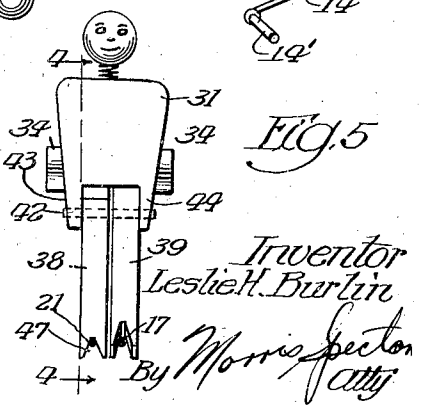


Fig. 5



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TIGHTROPE WALKING TOY

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Application May 14, 1945, Serial No. 593,560

9 Claims. (Cl. 46—131)

This invention relates to acrobatic toys of the tight rope walking type.

It is one of the objects of the present invention to provide a tight rope walking toy of a simple construction and in which the operator or the person manipulating the toy can readily cause a step by step walking movement of the toy, simulating a walking or hand over hand operation, wherein the movement of the toy across the tight rope is under complete control of the operator. It is a further object of the present invention to provide a structure of the above mentioned character wherein the walking toy is itself devoid of any springs or operating mechanisms and wherein the movement of the toy is brought about by a manipulative movement of the ropes upon which the toy rests.

The attainment of the above and further objects of the present invention will be apparent from the following specification taken in conjunction with the accompanying drawing forming a part thereof.

In the drawing:

Figure 1 is a front view of a toy embodying the present invention, with part of the structure broken away to illustrate the interior construction;

Figure 2 is a plan view of the toy of Figure 1;

Figure 3 is a perspective diagrammatic view of the tight rope arrangement of the toy of Figure 1;

Figure 4 is an enlarged view of the toy of Figure 1, said view being taken along the line 4—4 of Figure 5; and

Figure 5 is a front view of the walking figure of the toy.

Reference may now be had more particularly to Figures 1, 2 and 3 which illustrate the tight rope and its supporting structure upon which the toy figure walks. The supporting structure comprises a base 1 having a pair of similar uprights 2—3 at one end and another pair of similar uprights 4—5 at the opposite end. The uprights are in spaced parallel relationship, as may be seen from Figures 1 and 2. Rear and front sets of pulleys 6 and 7, respectively, are non-rotatably mounted between the respective uprights 2—3 and 4—5. The pulleys may be mounted between the uprights in any desired manner as, for instance, by screws 9 that thread through the respective uprights and into the spools constituting the respective pulleys. If desired the pulleys may be further locked against rotation as by driving an off center pin 12 through a hole in the upright and into a hole in the corresponding pulley. Each of the pulleys has two spaced peripheral grooves thereon for receiving the cords of a loop, as will be more fully explained. The front uprights 4 and 5 also have a double crank 14 journalled therein for rotation.

A cord of string is formed into a loop with one end of the cord tied at 15 to one crank, the cord then extending upwardly at 16, around the pulley 7 to a line 17, then around the groove of the pulley 6, thence downward as at 18 and around a non-rotatable pulley 19, then upwardly as indicated at 20, then again around the pulley 6, to a line 21, thence down around the pulley 7 and along the length 22 to the end of the cord which is then tied at 23 to the opposite crank. Both cranks have the same throw.

The pulley 19 is held against rotation by a bail 25 that hooks into the pulley below the center thereof, the bail being pulled downwardly by a coiled spring 26 which is secured as at 27 to the base between the uprights 2—3. The coiled spring 26 maintains a constant tension upon the looped cord. The lines 17 and 21 of the cord are parallel to one another and extend horizontally at the same level. They are spaced apart from one another a distance equal to the spacing between the legs of a toy walking figure to be placed on the tight rope.

A toy walking figure, which may be placed upon the tight rope, is indicated at 30. This figure may be of any desired shape and includes a wooden body 31 on which is secured a ball 32 by a spring 33, the ball being painted to simulate the face of a person. The body has a pair of arms 34 which are rigid with the body and to which is secured an inverted U-shaped or arcuate-shaped stiff wire 35 that carries weights 37—37 so as to bring the center of gravity of the figure below the legs 38—39. The legs 38—39 of the figure consist of rectangular wooden rods, in spaced relationship and pivoted by a pivot pin 42 between flanges 43—44 of the body of the toy. The two legs are in side by side relationship and each independently swingable about the pivot pin 42. Each leg has a limited stride or amount of swing the limit being reached when the top corner of the leg abuts against the surface 46 of the body of the toy. The construction is such that the stride of the legs 38—39 of the figure is appreciably less than the throw of the cranks 14. The bottom of each leg 38—39 has a V-shaped slot 47 therein. In the construction herein illustrated the slot is $\frac{5}{32}$ of an inch wide at the base and $\frac{1}{64}$ of an inch wide at the top, and is $\frac{3}{8}$ of an inch deep.

Assume that the walking figure 30 is placed

upon the lines 17—21 so that the lines extend into and through the slots 47 in the legs or limbs of the figure. Since the center of gravity of the figure is below the bottom of the limbs the figure will remain upright on the lines. Assume further that at the time the figure is placed on the lines the two legs 38—39 are parallel to one another. This assumption is made in the interest of simplicity of explanation, although it is understood that the legs of the figure may be in any desired position at the time the figure is first placed on the lines. The figure has a certain amount of weight and therefore will produce a certain amount of sag in the two lines 17—21 even though the lines are under tension by the spring 26. If the legs are parallel to one another the weight of the toy will be equally distributed between the two lines and both lines will sag exactly the same amount. The toy will rest on the line. Assume now that a turning movement is imparted to the crank 14 by turning the handle 14'. When that happens one of the lines 17—21 will be pulled away from the pulley 6 and the other line will be played out towards the pulley 6. Assume, arbitrarily, that the direction of turning of the crank 14 is clockwise. Therefore when the device is in the position illustrated in Figure 3 the line 17 will be pulled in the direction of the arrow and the line 21 will be played out so as to move in the direction of its arrow. It must be remembered the pulleys 6, 7 and 19 are held against rotation, hence the movement of the loop of the lines 17—21 is one wherein the loop slides or slips on the pulleys with a friction determined by the tension of the spring and the characteristics of the materials. Accompanying the slipping movement the tension of the line 17 which is moved away from the spring is increased, and the tension on the line 21, which is moved in the direction towards the spring 26, is decreased. This change in tension produces a change in the amount of sag of the two lines, the line 17 being drawn tauter and the line 21 becoming looser. This means that the line 17 which is tauter will be at an elevation slightly above the elevation of the line 21, which sags a little more than does the line 17. Therefore the leg 39 of the toy figure is raised, and the leg 38 of the toy figure is allowed to drop. As a result of the difference in elevation of the two legs of the toy figure more of the weight of the toy is carried on the leg 39 and less of it on the leg 38, although some of the weight of the toy is still carried by the leg 38. As the lines 17—21 continue to move in opposite directions the legs move with the respective lines until the legs of the toy figure reach the limit of the stride thereof. As stated above, the stride of the figure, as illustrated in Figure 4, is less than the stroke of the cranks. Therefore the two lines 17—21 continue to move in the direction indicated by the arrows in Figure 3, even after the limbs 38—39 have reached the limit of their stride. When that happens one or the other of the two legs will continue to move with its line and the other leg will be dragged along its line. It obviously follows that the leg 38 which is carrying less of the weight of the toy will slip with respect to the line, and the leg 39 will move along with the line 17. This results in a forward movement of the toy figure. As the crank continues to rotate and the direction of the movement of the lines 17—21 is reversed the initial effect of such reversal of movement of the two lines is that now the line 21 will be moving forward and be under greater tension than is the line 17. Therefore the line 17 will sag a greater amount than will the line 21, so that more of the weight of the toy will be carried on the leg 38 than on the leg 39. This reverse movement of the two lines 17—21 results first in the reverse movement of the two legs until the legs again reach their limit of movement, with the leg 38 foremost, and then upon continued movement of the line 21 the leg 38 moves with the line 21, and the leg 39 drags on the reverse moving line 17. Thus continued rotation of the crank handle 14' causes the two legs to move in a step by step manner and causes the entire toy to advance an amount equal to the difference between the throw of the cranks and the limiting stride of the legs during each half revolution of the crank. This continues until the toy figure reaches the end of the lines 17—21.

While I have herein shown the toy figure as consisting of the shape of a human figure walking on the lines 17—21, the limbs 38—39 need not necessarily be legs. They could be arms that extend upwardly from the body of the toy figure, one arm on each line 17—21, with the figure hanging from the lines 17—21. Also the figure toy need not be in human form. It can be in any desired form known in the toy industry.

In compliance with the requirements of the patent statutes I have here shown and described a preferred embodiment of my invention. It is, however, to be understood that the invention is not limited to the precise construction here shown, the same being merely illustrative of the principles of the invention. What is considered new and desired to be secured by Letters Patent is:

1. In a tight rope moving toy, two parallel side by side horizontal cords at substantially the same level for supporting a toy figure, means for maintaining a continuous tension on the cords, and means for reciprocating the cords in opposite directions and altering the relative tensions on the two cords whereby there is a change in the relative amounts of sag of the two cords.

2. In a tight rope moving toy, two parallel side by side horizontal cords at substantially the same level for supporting a toy figure, means for maintaining a continuous tension on the cords, means for reciprocating the cords in opposite directions and altering the relative tensions on the two cords whereby there is a change in the relative amounts of sag of the two cords, and a toy figure having pivoted limbs supporting the figure on both cords, said toy figure having its center of gravity below both cords, and the major portion of the weight of the figure being transferred alternately from one cord to the other as the relative sag in the cords changes.

3. In a tight rope moving toy, two parallel side by side horizontal flexible cords at substantially the same level, means for maintaining a continuous tension on the cords, and means for reciprocating the cords in a lengthwise direction 180° out of phase with one another and for altering the tension on each cord during its movement in one direction, whereby as the tension in each cord changes with respect to the other cord there is a change in the relative amounts of sag of the two cords.

4. A tight rope moving toy comprising two parallel side by side horizontal cords at substantially the same level, means for maintaining a continuous tension on the cords, means for reciprocating the cords in a lengthwise direction 180° out of phase with one another and for altering the tension on each cord during its move-

ment in one direction whereby as the tension in each cord changes with respect to the other cord there is a change in the relative amounts of sag of the two cords, and a toy figure resting on both cords, said figure having its center of gravity below both cords, and the major portion of the weight of the figure being transferred alternately from one cord to the other as the relative sag in the cords changes.

5. A tight rope moving toy comprising two parallel side by side horizontal cords at substantially the same level, means for maintaining a continuous tension on the cords, means for reciprocating the cords in a lengthwise direction 180° out of phase with one another and for altering the tension on each cord during its movement in one direction whereby as the tension in each cord changes with respect to the other cord there is a change in the relative amounts of sag of the two cords, and a toy figure resting on said cords, said figure including two pivoted limbs one of which rests on one cord and the other on the other cord, both limbs being movable with respect to the cords, and means for limiting the maximum spread of the limbs to an amount less than the amplitude of reciprocation of the cords.

6. A step by step moving toy having two legs pivoted for oscillation in spaced apart parallel planes, said legs having tapered grooves in the bottom surface thereof for gripping horizontally stretched supporting cords sufficiently to prevent slipping of the legs down the incline of the cords that results from sagging of the cords.

7. A step by step moving toy having two limbs pivoted for non-intersecting oscillation, the center of gravity of the toy being below the limbs, a cord looped to form two parallel horizontal lines, a pair of cranks displaced 180° from one another and connected to the ends of the cords, and means for maintaining a continuous tension on the loop between the lines for maintaining the lines taut, said loop slipping along the tension-maintaining means as the crank is turned and alternately increases the pull on one line and pays out cord to the other line, whereby the tension and therefore the amount of sag of the two lines is alternately changed.

8. A step by step moving toy having two limbs pivoted for non-intersecting oscillation, the center of gravity of the toy being below the limbs, a cord looped to form two parallel horizontal lines, a pair of cranks displaced 180° from one another and connected to the ends of the cords, means for maintaining the lines taut, said loop slipping along the tension maintaining means as the crank is turned and alternately increases the pull on one line and pays out cord to the other line, whereby the tension and therefore the amount of sag of the two lines is alternately changed, said limbs resting on said lines and being slidable thereon but said limbs having tapered grooves therein gripping the lines sufficiently to prevent slipping of the limbs down the incline of the lines that results from sagging of the lines whereby as the lines are reciprocated a major portion of the weight of the toy is supported by that limb which is on the line having the greater tension and therefore the lesser sag so that the toy moves with that line while the opposite limb drags on the other line thereby spreading the limbs of the toy.

9. A step by step moving toy having two limbs pivoted for non-intersecting oscillation, means for maintaining the center of gravity of the toy below the limbs, a cord looped to form two parallel horizontal lines, a pair of cranks displaced 180° from one another and connected to the ends of the cords, means for maintaining a continuous tension on the loop between the lines for maintaining the lines taut, said loop slipping along the tension maintaining means as the crank is turned and alternately increases the pull on one line and pays out cord to the other line, whereby the tension and therefore the amount of sag of the two lines is alternately changed, said limbs resting on said lines and being slidable thereon but said limbs having tapered grooves therein gripping the lines sufficiently to prevent slipping of the limbs down the incline of the lines that results from sagging of the lines whereby as the lines are reciprocated a major portion of the weight of the toy is supported by that limb which is on the line having the greater tension and therefore the lesser sag so that the toy moves with that line and the opposite limb drags on the other line thereby spreading the limbs of the toy, means for limiting the spread of the limbs to an amount less than the stroke of the cranks so that during each reciprocation the dragging limb is dragged along its line as the lines continue to move in opposite directions after the limbs have reached their limit of spread, whereby continued reciprocation of the lines by the cranks causes the limbs to oscillate and the toy to advance along the lines in a step by step manner.

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