

June 24, 1930.

J. N. VASCONCELLOS

1,768,174

GRAVITY OPERATED FIGURE TOY

Filed May 2, 1927

2 Sheets-Sheet 1

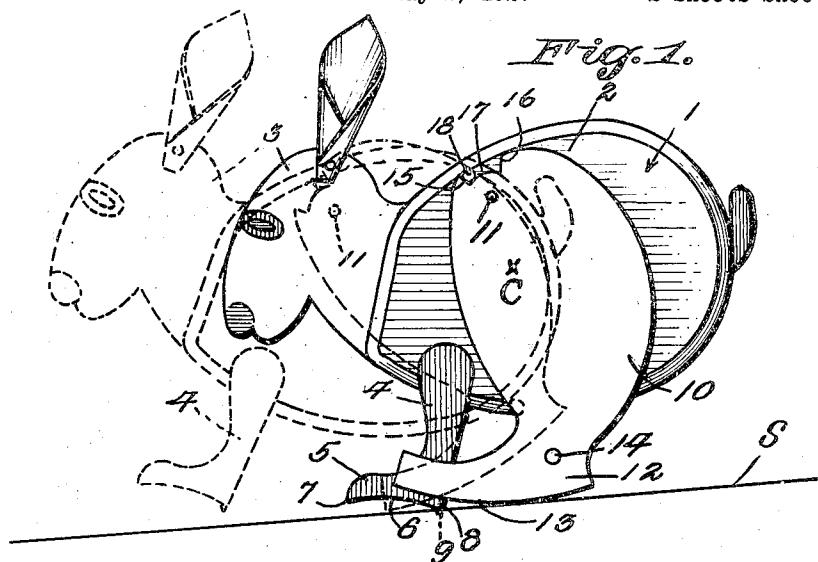


Fig. 2.

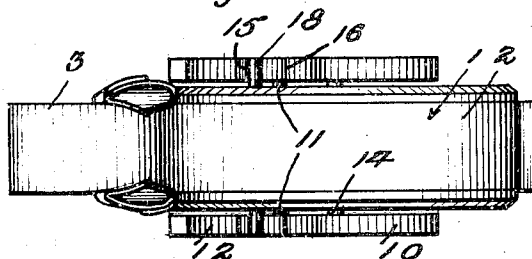
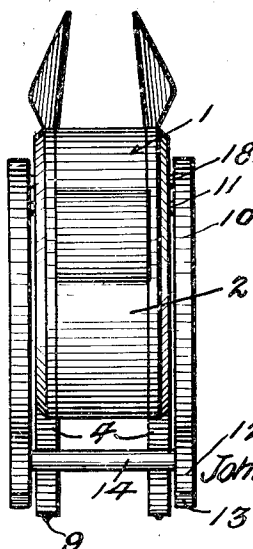


Fig. 3.



John N. Vasconcellos,
Inventor

Witnesses
C. E. Churchill
J. G. Smith

By Richard B. Owen

Attorney

June 24, 1930.

J. N. VASCONCELLOS

1,768,174

GRAVITY OPERATED FIGURE TOY

Filed May 2, 1927

2 Sheets-Sheet 2

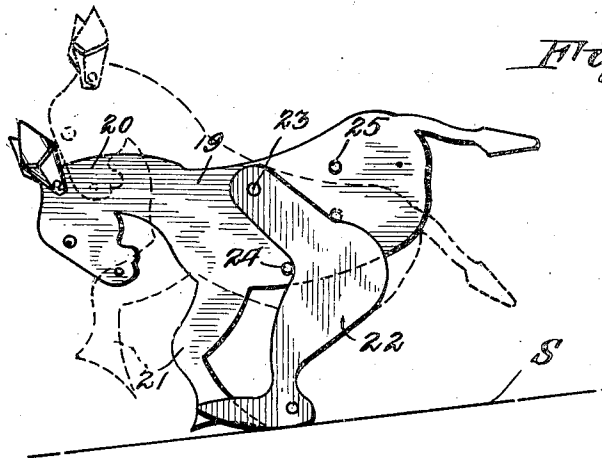


Fig. 4.

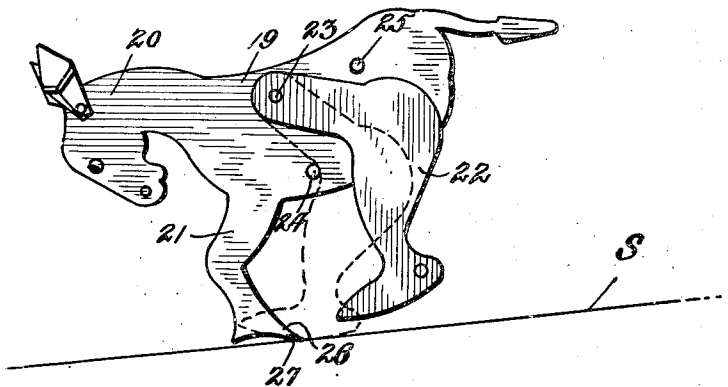


Fig. 5.

John N. Vasconcellos

Inventor

Witnesses
C. E. Churchillman
J. G. Smith

By Richard B. Owen

Attorney

UNITED STATES PATENT OFFICE

JOHN N. VASCONCELLOS, OF HONOLULU, TERRITORY OF HAWAII

GRAVITY-OPERATED FIGURE TOY

Application filed May 2, 1927. Serial No. 188,373.

This invention relates to improvements in toys and more particularly to that class of toys which are designed in imitation of animate objects such as animals and human beings and which, in use, simulate the body movements of the natural object. As a general rule such toys are operated either by spring motor or by the manipulation of a pull string or some other manually operable element. The toys which are operated by spring motors are expensive to manufacture and, in order to reduce the cost of the toys the motors and gear systems are usually of cheap material and construction and therefore the life of the toy is comparatively short. Such toys, of course, can be set in operation and viewed from a distance thus enhancing the appearance of actual animation, but toys of the class which must be operated by pull strings or other manually operable elements do not possess this advantage and the means whereby motion is effected is visible. In consideration of the foregoing it is the primary object of the present invention to provide a toy designed in imitation of an animate object such as an animal or human being and which will be entirely automatic in its functioning, being devoid of any motor means or any manually operable means for effecting its functioning to imitate or simulate the body movements of the natural object which it is designed to represent. Therefore the present invention contemplates a toy which will possess none of the disadvantages of toys of this class as usually constructed but which will, on the other hand, present a decided advantage in that the simulation of the body movements of the natural object is effected by a physical force rather than by any mechanical operating means, the toy being so constructed that the reason for its automatic functioning will not be immediately apparent to one observing the functioning of the toy.

Another object of the invention is to provide a toy possessing the characteristics and advantages outlined above and which toy may be produced at a very low cost and will be devoid of any parts which would be liable

to disarrangement or wear to an extent to render the toy no longer useful.

Another object of the invention is to provide for the simulation of the body movements of a natural object represented by the toy, which means will be based on a law of nature applicable in so many different ways that an almost unlimited variety of animate objects may be represented in the carrying out of the invention, so that, as a consequence, a child seeing one of the toys in imitation of one animate object as for example a rabbit, will desire a collection of toys representing a number of different animals, thus greatly enhancing the value of the invention from a commercial point of view.

In the accompanying drawings:

Fig. 1 is a view in side elevation of a toy constructed in accordance with the present invention and in imitation of a rabbit, the toy being illustrated in full lines in the position which it will initially be caused to assume on an inclined surface and in dotted lines in the second position which it will automatically assume when released;

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

Fig. 3 is a rear elevation thereof;

Fig. 4 is a view similar to Fig. 1 illustrating a toy in imitation of a donkey and illustrating two positions thereof one in full lines and a second in dotted lines;

Fig. 5 is a view similar to Fig. 4 illustrating in full and in dotted lines two other positions assumed by the toy.

The embodiment of the invention shown in Figures 1, 2 and 3 and in Figures 4 and 5 are identical except for minor details which will presently be made clear.

In the embodiment illustrated in Figures 1, 2 and 3 the animate object represented is a rabbit and the toy consists essentially of a body member 1 a portion 2 of which is shaped to correspond substantially to the shape of the body of a rabbit and is provided at its forward end with a portion 3 to represent the head of the rabbit. These parts as well as the other parts of the toy may be painted or otherwise finished or embellished in any desired manner as will be readily understood. The toy further includes as an essential fea-

ture, members 4 which are shaped to represent the forelegs of the animal and which are fixed to the forward portion of the body at the lower side thereof in any suitable manner as for example by having their upper ends set into recesses formed in the opposite faces of the body and secured by adhesive or nails or other fasteners, or in any manner found suitable. In the embodiment illustrated two of these members are employed but it is contemplated that they might be formed as a single member within the purview of the invention inasmuch as the invention contemplates, in this respect, broadly, what may be considered as a surface-contacting supporting element which is fixed with respect to the body. Each of the foreleg members 4 is shaped to conform generally to the shape of the foreleg of a rabbit and includes a portion 5 at its lower end shaped in imitation of the rabbit's paw, this portion of the member having its under side preferably concaved longitudinally as indicated by the numeral 6 so as to provide a toe portion 7 and a heel portion 8, and small spurs 9 will preferably be driven into the heel portions of the two members 4 so as to insure against slippage of these portions over the inclined surface upon which the toy is to be disposed, for functioning.

The toy further comprises a pair of members 10 which represent the hind legs of the animal and constitute other surface-contacting elements. These members 10 are shaped to conform substantially to the shape of the hind legs of a rabbit and they are pivotally mounted upon the opposite faces of the body 2 by means of pivot pins 11 which are located near their upper ends and forwardly of the vertical median lines of the respective members. The center of gravity of the toy as a whole, when the leg members 10 are in the position shown in full lines in Fig. 1, is substantially at the point indicated by the α mark on the drawings and by the reference letter C, and it will be observed that the pivots 11 are located above and in advance of the center of gravity of the body. It will further be observed that due to the location of the pivots 11 with respect to the center of gravity of the toy as a whole, the greater mass of the body 2 including the head 3 and members 4 is located rearwardly of a vertical line passing through the pivots. Furthermore it will be noted that as the pivots are located forwardly of the vertical median line of the leg members 10, these leg members will swing forwardly through gravity from the position shown in full lines in Fig. 1 upon elevation of the body 2. Each leg member 10 is formed at its lower end with a portion 12 which is shaped to approximately simulate the paw of the hind leg of the animal, and this paw portion 12 has a longitudinally convex lower edge 13 which is adapted to rock or roll upon the surface upon which the toy

is disposed for functioning. The purpose of so forming the paw or tread portion 12 will presently be made clear and it will be observed at this point that the length of the contacting surface 13 of the said portion is greater than the distance between the toe portions 7 and 9 of the corresponding portion 5 of the foreleg members 4.

The hind leg members 10 are preferably braced by a cross piece which may comprise a wood rod 14 secured at its ends in openings formed in the said members, adhesive being preferably applied to the said ends of the brace rod so as to prevent separation of the members 10 from the ends thereof. This rod may also serve as an abutment element for contact with the under side of the body 2 at the period in the functioning of the toy where the parts assume substantially the relative positions shown in dotted lines in Fig. 1 although preferably other means is provided for this purpose. The means referred to comprises spaced abutments 15 and 16 which constitute the end walls of an arcuate recess 17 formed in the upper end of each hind leg member 10, the means further comprising a stop pin 18 secured in each side face of the body 2 and projecting into the respective recess 17, the abutments 15 and 16 being designed to engage the pin 18 in the full and dotted line positions of the parts as shown in the said Fig. 1.

In the use of the toy the body 2 is grasped and the toy is bodily lifted whereupon the hind leg members 10 will swing forwardly by gravity until the shoulders 15 or other abutments provided, engage the abutment pin 18 as shown in full lines in Fig. 1 whereupon the toy is disposed upon an inclined surface such for example as an inclined board or an inclined sidewalk, indicated by the reference letter S. When so disposed the heel portions 8 of the foreleg members 4 will engage the surface as will also the longitudinally convex lower edges of the foot portions 12 of the hind leg members 10 and it will be observed by reference to Fig. 1 that at this time the body 2 is overbalanced due to the fact that the pivots 11 are located in advance of a vertical line passing through the center of gravity C. Therefore when the body 2 is released, the body will move suddenly forwardly, the portions 12 of the hind leg members 10 rocking at their lower edges upon the inclined surface, and this movement is illustrated in dotted lines in Figure 1. Immediately after assuming substantially the dotted line position, the body 2 of the toy will descend by gravity so that the heel portions 8 of the foreleg members 4 will be brought into contact with the surface S and at a point considerably in advance of the point where they engaged the surface in the initial position of the toy. The sudden forward movement of the body 2, which body is

of considerably greater mass than the hind leg members 10, creates sufficient momentum to effect further movement of the toy in the following manner. Due to the momentum of the toy, the body 2 will continue its forward movement at and immediately following the moment of contact of the heel portions 8 of the foreleg members 4 with the surface S until the toe members 7 of the paw portions 5 of the said foreleg members contact the surface at which time the lower ends of the hind leg members 10 will be clear of the surface S and will swing sharply forwardly to reassume the full line position shown in Fig. 1 and the operation of the toy is repeated throughout its travel down the inclined surface, the motion very closely simulating the motion of a rabbit in jumping over the ground surface. In the forward movement of the body 2 under momentum and at the end of this movement, the pins 18 will engage the abutments 15 thus suddenly arresting the forward movement of the toy as a whole and it is at this time that the toy has a tendency to overturn which tendency is sufficient to cause an elevation of its rear portion sufficiently to insure the paw portions 12 of the hind leg members 10 clearing the surface S to permit of the forward swinging movement of the leg members. I have discovered that the inclination of the surface upon which the toy will function need not be very great if the arrangement of the pivots and other elements of the toy is substantially as described.

From the foregoing description of the invention as illustrated in Figures 1, 2 and 3 of the drawings it will be understood that the toy is entirely automatic in its operation and functions under a law of nature rather than through the instrumentality of any mechanical or manually operable means. While the invention contemplates the disposal of the toy upon an inclined surface, it may be operated upon a level surface by attaching a piece of string to, for example, the head 3 of the toy and pulling upon the string although this is not entirely satisfactory as the pull upon the string must be along different lines at different intervals in order to effect the functioning of the toy, a more or less upward pull being necessary in order to cause change of position of the toy from the full line position shown in Fig. 1 to the dotted line position shown in said figure, and a more or less downward pull or straight forward pull being required to cause the parts to reassume the full line position.

The embodiment illustrated in Figures 4 and 5 of the drawings is substantially identical with that shown in Figures 1 to 3 inclusive except that in this instance the toy represents a donkey, the toy comprising a body 19 corresponding to the body 2 of the toy shown in the first described figures, a

head portion 20 corresponding to the head portion 3, fixed foreleg members or portions 21 corresponding to the members 4, and hind leg members 22 corresponding to the members 10 and pivoted as at 23 to the body 19 at a point corresponding substantially to the point of location of the pivot pins 11 of the previously described form. The embodiment shown in Figures 4 and 5 differs however from that shown in Figures 1 to 3 inclusive in that instead of the shoulders or abutments 15 and 16 and the stop pin 18 being employed, stop pins 24 and 25 corresponding respectively to the shoulders 15 and 16, in function, are secured in the opposite sides or faces of the body 19 and are engaged respectively by the front and rear edges of the hind leg members 22. Likewise, in this embodiment, instead of providing the heel portions of the foreleg members 4 which are here indicated by the numeral 21, with spurs corresponding to the spurs 9, these heel portions, which are indicated by the numeral 26, are preferably supplied with a coating of adhesive and particles of sand are applied to the surface of the said portions as indicated by the numeral 27 and will be caused to adhere thereto upon drying of the adhesive, these particles providing a rough surface which will not slip upon the inclined surface upon which the toy is disposed and functions.

Where the principles of the invention are embodied in a toy representative of a human being, the representation will be that of a human being who is crippled and is walking with a cane in each hand or on crutches in which event the canes or crutches together with the arm representations would constitute the fixed surface contacting element of the toy and the limbs would be pivoted and constitute the pivoted surface-contacting elements of the toy. It is even conceivable that the principles of the invention might be embodied in a toy constituting an imitation duck or other fowl or a bird, in which event one leg would be fixed with respect to the body and constitute the fixed surface-contacting supporting element, the webbed claw constituting a support, and the other leg would be pivoted to constitute the pivoted surface-contacting element of the toy, the claw representing member in a like manner constituting a surface-engaging support. Therefore it will be evident that the principles of the invention are susceptible of embodiment in an almost unlimited number of different kinds of toys representative of animate objects.

It is to be understood, of course, that various changes may be made, within the scope of what is claimed, without departing from the spirit of the invention.

Having thus described the invention, what I claim is:

An automatic-motion toy comprising a body, a surface-contacting supporting member fixed with respect to the body at one side of the center of gravity thereof, means at
5 the lower engaging end of the member for co-action with the surface to prevent slipping of the member when engaging the same, a second surface-contacting supporting member pivoted to the body at a point at
10 the same side of the center of gravity thereof, the last mentioned member being provided in its upper edge with a recess concentric to the pivot, the end walls of the recess constituting abutments, and a pin projecting laterally from the body and into the
15 recess.

In testimony whereof I affix my signature.
JOHN N. VASCONCELLOS.

20

25

30

35

40

45

50

55

60

65