

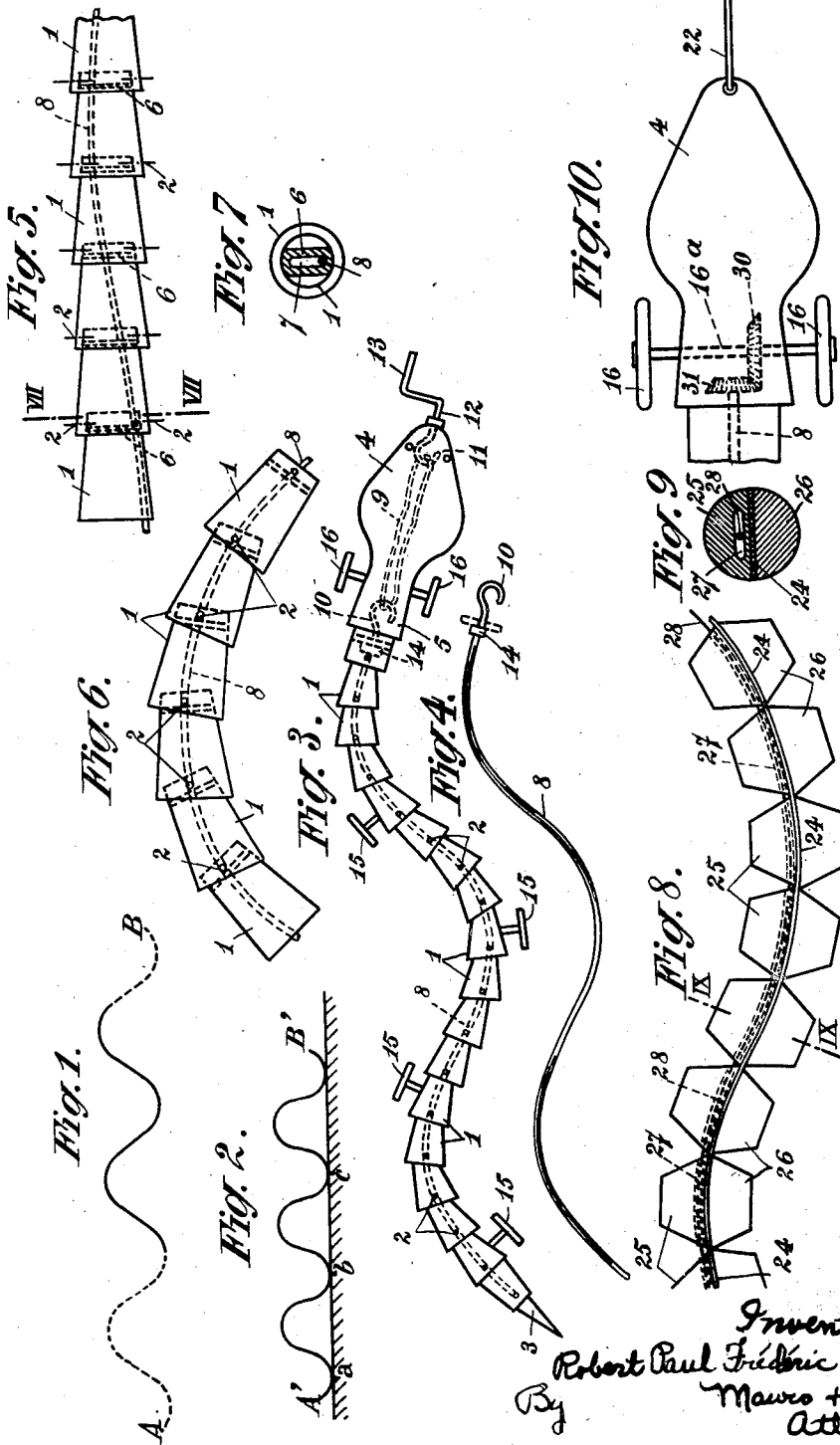
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TOY

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TOY

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The present invention relates to toys imitating reptiles (crocodiles, snakes, lizards, etc.), or fishes (eels).

Up to the present time it has been vainly endeavouring to devise toys of this kind capable of moving in exactly the same manner as the animals they represent.

The object of the present invention is to provide a toy of the type described capable of moving in exactly the same manner as the living animal for propelling itself.

An important feature of the toy according to the present invention is that the movement is positively imparted to the parts of the toy, that is to say all the points thereof are compelled, through a suitable mechanism, to move with the desired motion.

For this purpose, the body of the toy, which is of a shape imitating that of one of the animals above referred to, is made flexible in all directions in a plane, for instance a horizontal or a vertical plane, and inside this body there is mounted a flexible longitudinal member having, preferably, in the free states, the shape of a spiral of large pitch. Means are provided for giving this member a movement of rotation about itself whereby it imparts to said body undulatory and alternating deflections which serve to the propulsion of the toy. This propulsion may be improved by giving the external surface of the body of the toy a structure capable of increasing the friction of this body with respect to the surface on which it bears (for instance suitably directed projections, hairs or the like) or by providing suitable supporting organs, such for instance as wheels, disposed at different points along the body of the toy.

Instead of being devised for moving on the ground, the device according to the present invention can be devised in such manner as to be able to float in a liquid, its propulsion in said liquid being eventually facilitated by means of vertical fins disposed at suitable points along its length.

Other features of the present invention will result from the following detailed description of some specific embodiments thereof.

Preferred embodiments of the present invention will be hereinafter described with reference to the accompanying drawing, given merely by way of example, and in which:

Figs. 1 and 2 are diagrammatical explanatory views illustrating the two chief modes of propulsion of the device according to the present invention;

Fig. 3 is a plan view of the whole of a toy made according to a first embodiment of the present invention;

Fig. 4 shows, on an enlarged scale, the shape of the flexible longitudinal member through which the toy is propelled;

Fig. 5 is an elevational view in vertical projection, showing, also on an enlarged scale, a portion of the body of the toy;

Fig. 6 is a plan view corresponding to Fig. 5;

Fig. 7 is a sectional view on the line VII—VII of Fig. 5;

Fig. 8 is a partial plan view of a modification in which the body of the toy is made in a different manner;

Fig. 9 is a sectional view on the line IX—IX of Fig. 8;

Fig. 10 is a plan view of the head of the toy showing a modification of the mechanism for driving the longitudinal member.

In accordance with the above explanations, the toy or other device which is the subject of the present invention has, at any time, the shape shown in a diagrammatic manner by Fig. 1, that is to say the shape of a curve similar to a sinusoid, and this body is flexible in all directions in the plane of this curve. The motion that is obtained according to the invention consists of an undulatory motion of the toy in which the waves seem to be prolonged either toward A or toward B, according to the direction of rotation of the flexible longitudinal member above referred to. If the movement takes place in a horizontal plane (the toy resting over its whole length upon a horizontal flat surface) every point of the toy moves by sliding in the direction of the tangent at this point to the curve shown by Fig. 1, and the whole of the system moves, either toward A or toward B, along the path shown in dotted lines.

If the plane in which the deformations of the toy take place is a vertical plane (the toy bearing upon a horizontal flat surface at points a, b, c) and the direction of the displacement is from A' toward B', all of the points of the curve between c and b come successively into contact with this horizontal supporting surface and for each period the whole of the system moves forward a distance equal to the difference between the distance between points c and b along the curve and the distance between c and b along a straight line passing through both of these points.

In the embodiment shown in Fig. 3, the toy is devised to undulate in a horizontal plane. In this embodiment, the body of the toy consists of a series of annular elements 1 pivoted to one another

other about vertical pins 2. This body is provided, at one of its ends, with a pointed part corresponding to the tail of the animal and, at the other end, with a head 4 connected to the adjacent annular element through a part 5 which corresponds to the neck of the animal.

In each of these annular members 1, there is provided a vertical cross piece 6 (Fig. 7) provided with a central hole or, preferably, with a slot 7 parallel to pins 2. A flexible and elastic rod 8 (consisting for instance of a piano string), which has previously been given the shape of a helix (Fig. 4) preferably of large pitch, is passed through the holes or slots of the various cross members 6. As the body of the toy cannot be deformed in the vertical direction, this member 8 is deformed by being flattened in the vertical direction (Fig. 5). On the contrary, in the horizontal plane, member 8 imparts its deformation to the body of the toy, giving it an undulated shape, as shown by Fig. 6.

It will be readily understood that if rod 8 is caused to rotate about itself each of its points imparts to the corresponding point of the undulating body of the toy an alternating translation of an amplitude equal to that of the undulated curve corresponding to said member 8. This translation takes place in a plane at right angles to pins 2 (a horizontal plane in the present case) and produces an undulatory motion of the chain of annular elements 1. The waves of this chain move toward the right or toward the left, according to the direction of the rotation of rod 8. In the example shown in the drawing, the rotation of rod 8 is produced by a rubber string 9 mounted in the head 4 of the toy and secured, on the one hand, in a hook 10 carried by the end of said rod 8, and, on the other hand, in a similar hook 11 carried by the end of a spindle 12 provided with a crank 13 permitting to wind up this rubber string. Rod 8 is provided with a stop 14 preventing its axial displacement under the effect of the tension of the rubber string. In order that the sliding movement of the body of the toy on the ground may be possible only in the direction of its longitudinal axis, said body may be provided with small rollers 15, a pair 16 of which shall advantageously be provided at the head of the toy.

The flexible longitudinal member 8 might also consist of a series of elements articulated to one another.

Fig. 8 shows a modification of the undulatory body in which said body includes a supple ribbon or band 24 on either side of which are fixed juxtaposed rigid elements 25—26 which prevent deformation of the whole in a plane different from that of the figure. All the elements 25 disposed on the same side of the ribbon are each provided with a slot 27 located as close as possible to said ribbon (Fig. 9) and through which passes the longitudinal spiral shaped element 28, corresponding to member 8 of the preceding embodiment.

Fig. 10 shows a modification of the mechanism for driving this longitudinal member which can be applied, for instance, when the toy is to be dragged on the ground by means of a string 29 fixed for instance to the front end of the head 4. In this embodiment, said head is carried, as above explained, by a couple of wheels 16, but on the axle 16* of said wheels there is keyed a bevel pinion 30 which meshes with another bevel pinion 31 fixed to the front end of the longitudinal spiral-shaped member 8, whereby the rotation of the wheels is transmitted to the said member.

As above stated, the toy or device according

to the present invention can also be adapted to move in a liquid, for instance in the manner of a crocodile or an eel, and this movement may take place as well in a vertical plane as in a horizontal plane. It will suffice, in this case, to arrange that the toy may float in the liquid, for instance by providing it with a liquid-tight and flexible sheath or by devising either the whole or a part of the body in such manner that it may float in the liquid.

In this case, the toy may also be made of two parts: One of these parts, the upper one, consists of a flexible material capable of floating in the liquid which is suitably shaped so as to imitate the body of the animal, while the other part, disposed under the first mentioned one may consist, for instance, of flat elements of sheet metal cut to the desired shape and jointed to one another about vertical pins, these elements being provided with vertical guides forming slots through which is passed the elastic spiral-shaped rod corresponding to rod 8 of the preceding embodiments.

When this rod is caused to rotate it produces undulations of these elements about their axes of articulation, thus causing the system to be propelled as above explained. These undulations are transmitted to the body made of a flexible material through which the whole is supported in the liquid and which also serves to hide the jointed metallic elements above referred to.

Of course, the present invention is not limited to its application to toys. It may be used, in a general manner, for producing propelling devices and more especially nautical propellers.

While I have, in the above description, disclosed what I deem to be practical and efficient embodiments of the present invention, it should be well understood that I do not wish to be limited thereto as there might be changes made in the arrangement, disposition and form of the parts without departing from the principle of the present invention as comprehended within the scope of the appended claims.

What I claim is:

1. A toy or other device of the kind described for use either on the ground or in a liquid, which comprises, in combination, a flexible body of elongated shape, deformable only in one plane, said body being provided with a passage extending throughout its length, a flexible elastic elongated member extending through said passage, said member having when free the shape of a helix the diameter of which is greater than the width of said passage in the direction of the plane in which said body is deformable, and means for causing said member to rotate about itself inside said body.

2. A device according to claim 1 in which said last mentioned means include a mechanical motor mounted inside said device and means for winding up said motor.

3. A device according to claim 1 for use on the ground, in which the last mentioned means include at least one wheel for supporting a portion of said device adapted to run on the ground, and means for transmitting the rotary motion of said wheel to said member, the device being, in this case, intended to be dragged upon the ground.

4. A device according to claim 1 further including means provided along said body for facilitating the crawling motion of the body along the undulated curve corresponding to the shape of said member.

5. A device according to claim 1 in which said

body includes supporting means for permitting said body to float in a liquid.

5 6. A toy or other device of the type described for use either on the ground or in a liquid, which comprises, in combination, a flexible body of elongated shape including a plurality of elements pivotally connected to one another about parallel axes, each of these elements being provided with an elongated hole parallel to said axes, a flexible
10 elastic elongated member extending through all of said holes, said member having when free the shape of a helix the diameter of which is greater than the maximum length of any of said holes, and means for causing said member to rotate
15 about itself inside said body.

7. A device according to claim 6 in which said elements are annular and engage in one another, further including a plurality of parallel pins, each

for pivotally jointing one annular element to the adjacent annular element.

8. A device according to claim 6 in which said body includes a supple ribbon and a plurality of elements secured to said ribbon on either side
5 thereof so as to be pivotally assembled to one another about parallel axes disposed transversely to said ribbon.

9. A device according to claim 6 in which the last mentioned means include a torsional elastic
10 piece fixed to one end of said member and means for twisting the other end of said piece.

10. A device according to claim 1 in which said passage has, in cross section, an elongated shape in a direction at right angles to the plane in
15 which said body is deformable.

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