

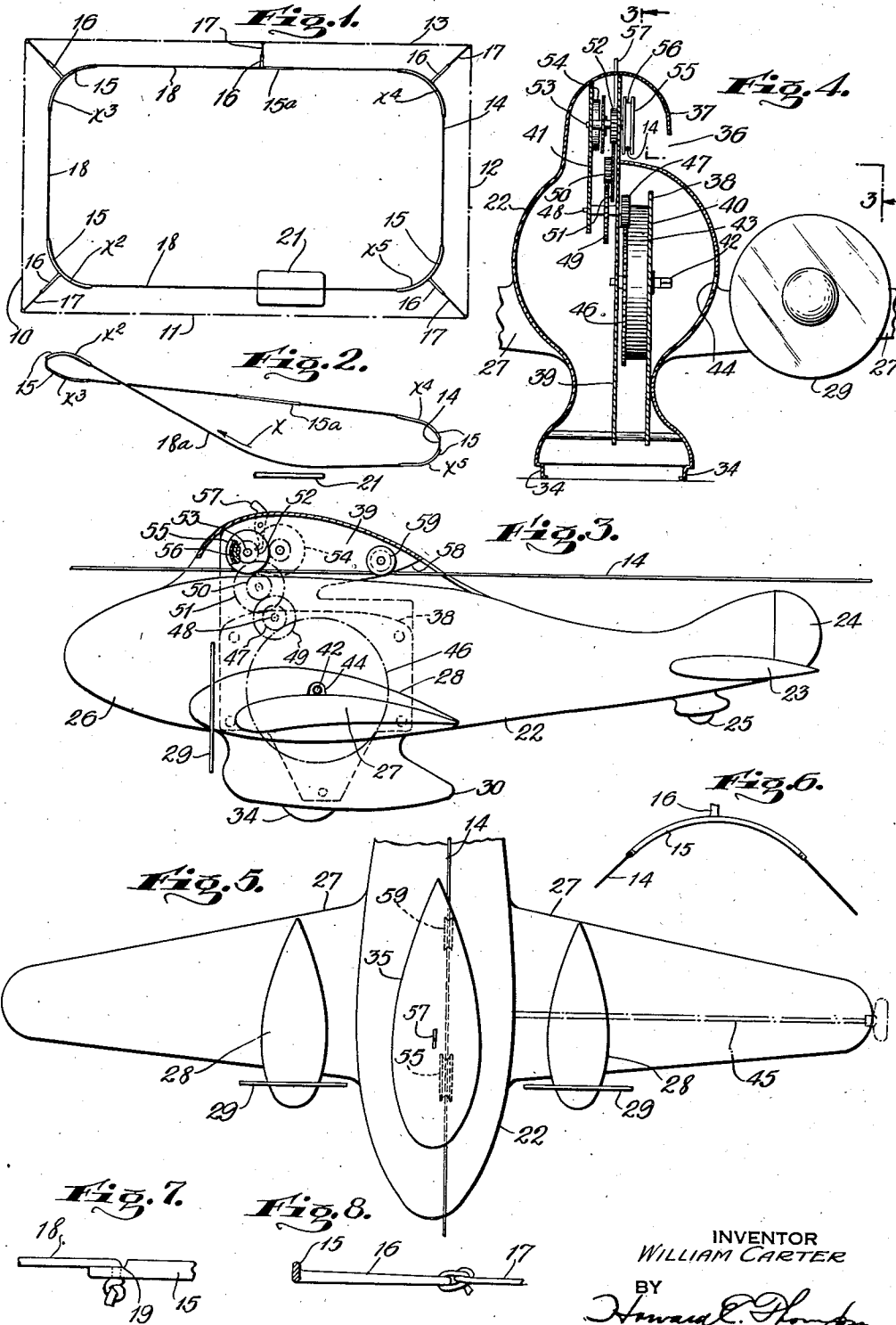
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MECHANICAL TOY

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MECHANICAL TOY

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This invention relates to toys particularly of the mechanical or spring motor driven type, and to toys of this type employing a guide rail or cord upon which the toy is operated; and the object of the invention is to provide a toy device or apparatus of the class described involving a relatively long rail or cord including upwardly inclined, horizontal and downwardly inclined portions or sections as well as curved corners or sections whereby a toy device in the form of an aeroplane or the like may be operated upon said rail by its self-contained motive power to simulate a take-off, flight and landing of an aeroplane in one continuous cycle of operation, to imitate as near as possible the actual flight or operation of an aeroplane; a further object being to provide a toy of the class described, the aeroplane or other movable body of which includes in the housing or fuselage thereof a spring motor mechanism, which is balanced in its mounting therein, to maintain the aeroplane or other body in a desired plane of operation while traversing over the track or rail; a further object being to provide a motor or power mechanism, involving two guide rollers adapted to engage the track or rail, at least one of which is power driven and preferably provided with a friction surface with means for governing the speed of the motor and further with means for controlling the stopping and starting thereof; a further object being to provide a channeled or U-shaped hood which envelops the guide and traction rollers of the toy to facilitate the quick attachment and detachment of the toy with the track or rail, and which also acts as a guard against displacement of the toy from the track or rail should the traction and guide wheels be accidentally disengaged from the track or rail; a further object being to provide in the track or rail corner and other reinforcing sections, preferably composed of a relatively firm or rigid material which may, however, be shaped to the desired curvature or contour, with means at the ends of said sections for coupling track or rail cords or strands therewith, and further with means whereby said sections may be coupled with suitable supports arranged outwardly of and in spaced relation to the track or rail; and with these and other objects in view, the invention consists in a toy of the class and for the purpose specified, which is simple in construction, efficient in use, and which is constructed as hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying

drawing forms a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which:

Fig. 1 is a diagrammatic plan view indicating one method of mounting a guide or supporting track or rail in connection with the walls of a room or compartment.

Fig. 2 is a diagrammatic side view substantially illustrating an arrangement of track or rail elevation.

Fig. 3 is a side and sectional view of a toy in the form of an aeroplane, indicating the method of supporting the same upon a track or rail.

Fig. 4 is a transverse sectional view through the aeroplane shown in Fig. 3 with parts of the construction broken away.

Fig. 5 is a plan view of the front end portion of the aeroplane shown in Figs. 3 and 4 and indicating the position of the traction and guide wheels thereon.

Fig. 6 is a detail view of one of the curved rail sections which I employ.

Fig. 7 is an enlarged detail view of one end portion of a rail section indicating one method of attaching a rail cord or strand therewith; and,

Fig. 8 is a sectional detail view illustrating the supporting arm of one of the rail sections.

In the use and operation of my improved toy, the same may be set up and operated in a room or compartment or out of doors, in which latter case, the guide track or rail will be supported in connection with posts, trees or other similar supports to keep the same above the ground. To simplify the illustration, I have diagrammatically shown in Fig. 1 of the drawing, by the dot and dash lines 10, 11, 12, and 13, what may be regarded as the walls of a room or compartment. At 14, I have illustrated a guide track or rail, which in the construction shown, consists of four curved corner sections 15 and one straight side section 15a. All of these sections are provided centrally thereof with outwardly extending supporting arms 16, to the free ends of which are attached cords or wires 17 for mounting the same in connection with the walls or the intersecting corners of the walls as is diagrammatically illustrated in Fig. 1 of the drawing.

In between the sections 15, 15a are flexible cord or wire sections 18 which are tied, knotted or otherwise coupled to reduced end portions 19 of the sections 15, 15a in the manner indicated

in Fig. 7 of the drawing so as to maintain, as near as possible, the upper surface of the section 18 in common alinement with the upper surface of the sections 15, 15a to form a substantially continuous unobstructed traction surface. Upon a consideration of Fig. 8 of the drawing, it will appear that the supporting arms 16 are set below the upper surfaces of the sections 15, 15a so as to provide free passage of the flanges of the traction and guide rollers of the toy thereover to prevent what might be termed derailing of the toy.

In Fig. 2 of the drawing, I have diagrammatically illustrated the method of supporting the guide track or rail 14 to produce a desired climbing of the toy, a horizontal movement, and a descending or landing of the toy from a starting point, such for example as a table top indicated at 21 in Figs. 1 and 2. That part or section 18a of the sections 18 which is located at the lower portion of Fig. 1 of the drawing will constitute a flexible section extending between the corner sections 15, arranged at the lower part of said figure.

In the operation of the toy, the aeroplane will be started from the table 21 and rise upwardly in the direction of the arrow x, pass around the corner x² and then horizontally across and will travel slightly in a downward direction until it passes around the corner x³, after which it will continue to travel in a downward direction, passing around the corners x⁴ and x⁵ and will stop in a graceful landing upon the table top 21. In other words, the motive power of the toy is sufficient to propel the toy to the highest point of inclination on the track and to give it a start in its downward travel, after which it will continue to operate by gravity until it reaches the landing.

The track or rail may be arranged in any desired plan or contour, or to travel through spirals or around several corners in an irregular and non-symmetric fashion; and the illustration in Figs. 1 and 2 of the drawing is simply to clearly illustrate one method of carrying the invention into effect. The sections 15 may be constructed of such material as to facilitate bending thereof, while at the same time maintaining a predetermined curvature or contour when the device is in use; but, in most cases, said sections will assume a curved or arc-shaped contour to care for angular arrangement of adjacent sections 18.

In Figs. 3, 4, and 5 of the drawing, I have shown one form of toy which I may employ, the same being fashioned to represent an aeroplane, and consists of a suitable body or fuselage 22 which may be constructed of any suitable material and terminates at its rear end portion in the representation of elevators 23, rotor 24 and a bottom landing wheel 25; whereas, the forward end portion of the fuselage has a rounded or contracted nose portion 26, rearwardly of which the opposite sides of the fuselage has the representation of laterally extending wings 27 with enlarged portions 28 thereon to represent motors disposed at each side of the fuselage. The forward end of the motor representations has disks 29 thereon, preferably composed of celluloid or semi-transparent material to give the representation of fast rotating propellers when the toy is in operation. The lower side portions of the fuselage 22 are provided with outwardly projecting frame portions 30 having

projecting wheel representations 34 to simulate the landing gear of an aeroplane. It may be said here that this structure would be modified in designing the toy in the form of a hydroplane for making take offs and landings on a tub, basin or other body of water. On top of the fuselage is an upwardly projecting curved or U-shaped body 35 preferably of the longitudinal contour represented in Fig. 5 of the drawing. This body is open at one side as indicated at 36 in Fig. 4 of the drawing to form a substantially hook-shaped guard and safety housing 37 at one side of the projection 35 to prevent accidental displacement of the aeroplane from the track 14 should the same become dislodged from the track and guide rollers. The projecting body 35 may be characterized to represent the pilot compartment or cabin of the aeroplane.

Arranged within the forward end portion of the fuselage 22 is a spring motor unit 38 consisting of a central plate 39 and two side plates 40 and 41 which may be supported in any desired manner in connection with the fuselage and which is so arranged as to equally balance the several motor parts in the fuselage so that the wings of the aeroplane are maintained in a horizontal position when mounted upon the track or rail 14.

Any desired type of spring motor may be employed, and in the construction shown, I have indicated at 42 the rotatable or winding shaft of the spring 43 of said motor. The square or angular end of the shaft 42 is accessible through an opening 44 in one side of the fuselage and by a long shaft key indicated in dot and dash lines at 45 in Fig. 5 of the drawing. At one side of the spring 43 is a large drive gear 46 which is driven by said spring, the gear 46 engaging a pinion 47 on a shaft 48 on which is another gear 49 in operative engagement with a pinion 50 having a larger gear 51 meshing with a gear 52 on a drive shaft 53, the rotation of which is controlled by a suitable governor 54. The shaft 53 has a drive or traction wheel 55 outwardly of the center plate 39, and the surface 56 of this wheel is preferably composed of friction material, such as rubber or the like.

I also employ a hand operated stop and start pawl 57 for controlling the stopping and starting of the motor, and especially in the operation of winding the spring 43. The frame plates 39 and 41 are provided with rearwardly directed extensions 58 in connection with which is supported a guide roller or wheel 59 which aids in supporting the plane in proper longitudinal position with respect to the rail and also aids in guiding the aeroplane in its movement over the rail 14.

The power of the spring motor will be sufficient to operate the toy or aeroplane over a predetermined and specific limit of inclination of a track, or in other words, at a predetermined pitch as well as for a predetermined length of a track. In the sale of the toy, instructions or specifications will be given to indicate these limits. However, in experience I have found that the aeroplane may be operated to travel upwardly an elevation of several feet within the length of a room of normal size. However, if the plane is made sufficiently light and the motor power sufficiently strong, the limits of upward travel and distance travel can be proportionately increased.

In the event that the track or rail 14 has not been properly set up for a given toy, or further, in the event that the spring of the motor has not

been properly wound, no detrimental accident can take place in that the toy will remain on the rail at all times, and may simply slide backwardly on an inclined section.

My invention is not limited to the contour or design of the toy herein illustrated, nor to the particular type of motor herein diagrammatically indicated, and various other changes may be made in the design and construction of the toy within the scope of the invention herein defined.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a toy having a motor driven traction wheel, a track upon which said wheel is mounted, means including the wheel for guiding the toy in its movement over said track, means involving curved track sections for supporting the track in connection with supports arranged in spaced relation thereto and with portions of said track arranged in upwardly and downwardly extending directions, said toy being propelled along the track by the rotation of said traction wheel through power means self-contained in the toy, said traction wheel having a surface of friction material, and the toy including a hook-shaped hood portion arranged adjacent the traction wheel and preventing accidental displacement of the toy from the track.

2. In a toy apparatus of the class described, a toy member of predetermined contour, a spring motor in said member, a traction wheel arranged in the upper portion of said member and adapted to engage a rail to suspend the member therefrom, said traction wheel being driven by said motor to propel said member longitudinally of the rail, the upper end portion of said member including a U-shaped housing partially encircling said traction wheel, the motor being centralized and balanced within said member to maintain predetermined horizontal arrangement of said member, and a guide wheel arranged in spaced relation to said traction wheel to aid in supporting and guiding the member on said rail.

3. In combination with a toy aeroplane having self-contained motive power and a traction wheel driven by said motive power, of means arranged and supported above a floor or other surface for suspending the aeroplane when in operation and for guiding the same in upward, horizontal and downwardly extending directions to simulate the take-off, flight and landing of an aeroplane, the take-off and flight of the aeroplane being mechanically driven by said traction wheel over said first named means, means on the aeroplane to aid in supporting and guiding the plane in its movement over said suspending means, and means on the aeroplane adjacent said traction wheel and last named means for preventing accidental displacement of the aeroplane from said suspending means.

4. In combination with a toy aeroplane having self-contained motive power and a traction wheel driven by said motive power, of means arranged and supported above a floor or other surface for suspending the aeroplane when in operation and for guiding the same in upward, horizontal and downwardly extending directions to simulate the take-off, flight and landing of an aeroplane, the take-off and flight of the aeroplane being mechanically driven by said traction wheel over said first named means, means on the aeroplane to aid in supporting and guiding the plane in its movement over said suspending means, means on the aeroplane adjacent said

traction wheel and last named means for preventing accidental displacement from said suspending means, said suspending means involving a plurality of flexible and substantially rigid rail sections, and predetermined rigid sections being curved.

5. A toy of the class described comprising a suitable body, a power operating unit arranged in said body, said unit comprising a frame consisting of a central plate and two side plates, a drive shaft mounted in the central plate and one of said side plates adjacent the lower portion of said unit, a driven shaft mounted in the central plate and the other of said side plates at the upper portion of said unit, a gear train for placing the drive shaft in operative engagement with the driven shaft, a spring for operating the drive shaft, a traction wheel on the driven shaft, and means involving a governor for controlling the operation of the driven shaft to propel the toy by said traction wheel over a support engaged thereby.

6. A toy of the class described comprising a suitable body, a power operating unit arranged in said body, said unit comprising a frame consisting of a central plate and two side plates, a drive shaft mounted in the central plate and one of said side plates adjacent the lower portion of said unit, a driven shaft mounted in the central plate and the other of said side plates at the upper portion of said unit, a gear train for placing the drive shaft in operative engagement with the driven shaft, a spring for operating the drive shaft, a traction wheel on the driven shaft, means involving a governor for controlling the operation of the driven shaft to propel the toy by said traction wheel over a support engaged thereby, said unit being balanced in the body of the toy, and the upper portion of the toy having a hook-shaped hood arranged over and partially covering said traction wheel.

7. In a toy having a motor driven traction wheel, a track upon which said wheel is mounted and from which the toy is suspended, said track including upwardly and downwardly extending portions to provide for the ascent and descent of the toy in traversing said track, means including said driven traction wheel for propelling the toy in its upward movement over the inclined portion of the track in ascending, and means for guiding the toy over the track including the descending portion thereof, and means for supporting the track in connection with supports arranged in spaced relation thereto to permit movement of the toy longitudinally of the track.

8. In a toy having a motor driven traction wheel, a track upon which said wheel is mounted and from which the toy is suspended, said track including upwardly and downwardly extending portions to provide for the ascent and descent of the toy in traversing said track, means including said driven traction wheel for propelling the toy in its upward movement over the inclined portion of the track in ascending, means for guiding the toy over the track including the descending portion thereof, means for supporting the track in connection with supports arranged in spaced relation thereto to permit movement of the toy longitudinally of the track, said last named means including curved track sections, the motive power for driving the traction wheel being self-contained in the toy, and the traction wheel having a surface of friction material.

9. In a toy apparatus of the class described employing a motor driven toy element of predetermined design, said element having a self-contained motor and a traction wheel driven by
5 said motor, means for supporting and guiding said element in the operation thereof, said means comprising a relatively long elevated track including upwardly extending portions, horizontal
10 portions and downwardly extending portions, said element being mechanically driven over predetermined portions of said track by said traction wheel, means involving rail sections of relatively rigid material for supporting the rail in
15 spaced relation to predetermined vertical supports arranged outwardly of the rail and above a floor or other surface, some of said rail sections being curved, rail sections of flexible material joining said rigid sections, and means for coupling the flexible sections to the rigid sec-

tions so as to arrange upper surfaces of both sections in common alinement.

10. In a toy apparatus of the class described, a toy device having a casing of predetermined
5 contour, a spring motor mounted within and supported by said casing, a traction wheel on said casing and driven by said motor to provide the sole means of mechanically moving the device over its support, means in addition to said
10 traction wheel for guiding said toy over a support, and the support for said device comprising an elongated guide rail having upwardly, horizontally and downwardly extending sections and curved corner sections, whereby in the movement
15 of said toy device over said rail by the engagement of the traction wheel therewith, the same will simulate the take-off, flight, and landing of an aeroplane.

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