The invention relates to toy vehicles of the track type and, more particularly, to toy vehicles which follow a predetermined path owing to the effects of gravity.

It is an object of the invention to provide a toy vehicle which maintains a path dependent upon the selected course of a substantially triangular-in-section toy track.

It is another object of the invention to provide a toy vehicle whose mean course is maintained along a pre-selected route as a result of the influence of gravity.

It is still another object of the invention to provide a self-tracking toy vehicle which, in effect, feeds back to the vehicle's steering wheels, as a result of gravity, a course-centering impulse.

It is still another object to provide a self-tracking toy vehicle which does not require guide rails or fences.

It is yet another object of the invention to provide a generally improved toy tracking vehicle.

Other objects, together with the foregoing, are attained in the embodiment described in the following description and shown in the accompanying drawings in which:

FIG. 1 is a top plan view of the toy vehicle with the weight elements in central position;

FIG. 2 is a sectional view, the plane of the section being indicated by the line 2—2 in FIG. 1;

FIG. 3 is a sectional view, the plane of the section being indicated by the line 3—3 in FIG. 1;

FIG. 4 is a top plan view showing the toy vehicle on a curved portion of the track; and

FIG. 5 is a sectional view, the plane of the section being indicated by the line 5—5 in FIG. 4.

While the toy vehicle device of the invention is susceptible of numerous physical embodiments, depending upon the environment and demands of use, substantial numbers of the herein shown and described embodiment have been made, tested and used, and all have performed in a totally satisfactory manner.

The device of the invention, generally characterized by the reference numeral 12, comprises an elongated, preferably rectangular and planar framework 13, or chassis, having mounted thereon a small electric motor 14 which serves to drive a pair of rear angular elements driven at the drive wheels 16 through an appropriate drive gear 17 and driven gear 18 (see FIG. 1).

A switch 21 of conventional type, serves to operate, or deactivate, the motor 14, the switch 21 being angularly movable between the vertical "off" position shown in FIG. 2 and an inclined or "on" position wherein the motor motor circuit is closed.

Serving to energize the electric motor, when the switch is in "on" position, is a suitable energy source such as a pair of electric dry-cells 26 connected, by appropriate conductors 27, through the switch 21, to the motor 14.

In other words, so long as the switch 21 is in "on" position, the rear wheels 16 are driven, thus causing the toy vehicle to move forwardly.

Guidance of the vehicle along a predetermined path is effected by the force of gravity acting upon a weight member, which in turn actuates a steering linkage.

The toy vehicle device of the invention includes a track, generally designated by the reference numeral 31, the track including a planar base portion 32 adapted to be supported on the floor, and a pair of inclined legs 33 terminating in an arcuate formed apex 34. Conveniently, as appears in fragmentary fashion in FIG. 4, the track 31 is curvilinear and is preferably endless so that the vehicle can travel continuously, if desired.

Although not shown, for purposes of clarity, the toy vehicle would also ordinarily include a vehicle body mounted on the chassis 13 and covering the various operative components in the interests of realism. The forward end of the body (not shown) supports a rigid forward transverse member 36 coplanar with the chassis or framework 13.

A fore and aft trunnion shaft 41 is mounted on the forward end of the chassis 13 and the after portion of the transverse member 36, the trunnion shaft 41 lying on the longitudinal, or fore and aft axis, of the elongated vehicle chassis.

Journalled on the trunnion shaft 41 is a transversely disposed planar track member 43 having rotatably mounted on each of the lateral ends thereof a clevis 44 (see FIG. 3) adapted to pivot about an axis perpendicular to the plane of the track member 43.

Projecting outwardly from each clevis is an axle 46 having a wheel 47 rotatably mounted thereon.

Steering of the front wheels 47 is effected by lateral angular movement of the electric cells 26, which serve as a weight, the cells 26 being lodged in a case 54 from which forwardly projects a pivot arm 52. The forward end of the pivot arm 52 is turned downwardly to form a pivot pin 53, the pin 53 being pivotally mounted adjacent the forward end of the track member 43.

In rolling contact with the after portion of the track member 43 is a roller 56 journalled on the pivot arm 52, the roller 56 serving to support the weight of the battery 26 and to impose this weight upon the track member 43.

As appears most clearly in FIG. 1, when the track member is horizontal, the pivot arm 52 is aligned in a fore and aft direction, and the roller 56 is centrally located with respect to the fore and aft trunnion shaft 41, with the result that there is no tendency for the roller 56 to roll laterally.

When, however, the track member is cocked, or tilted, as appears most clearly in FIGS. 4 and 5, the roller 56 rolls toward the low side under the influence of gravity acting on the weighted battery case 51 and causing the pivot arm 52 to swing, as shown.

As the pivot arm 52 moves, an upright pin 61 mounted on a transverse tie rod 62 is urged toward the low side. As appears in FIGS. 1 and 4, a second or companion pin 64 is mounted on the tie rod on the opposite side of the pivot arm 52 so that angular movement of the pivot arm 52 in either lateral direction will be imparted to the tie rod 62.

Transverse movement of the tie rod 62 is, in turn transmitted to a generally fore and aft link 66 mounted on each clevis 44, the link 66 extending rearwardly and being pivotally mounted at 67 on the corresponding end of the tie rod 62.

As a result of the foregoing linkage arrangement, it can be seen that movement of the tie rod 62 in the direction shown in FIG. 4 causes the clevises 66 to rotate and the front wheels 47 to turn toward the apex 34 of the triangular-in-section track 31 and to guide the vehicle toward the crestline 71 of the track.

In operation, the toy vehicle is initially placed with the opposite wheels straddling equally the crest of the track and the front wheels aligned in a fore and aft direction generally tangent with the crest-line. The switch is then turned on and the vehicle starts moving along the track.

Curvature of the track, in the case of a curvilinear track, or track irregularities, soon cause the front wheels to steer away from the crest-line and toward a lateral, downhill direction. As this occurs, one of the wheels (see FIG. 5) becomes lower whereas the other wheel, in moving upwardly toward the crest-line, becomes higher.

As this difference in elevation is produced, the truck member 43 is inclined, as is the pivot pin 53. Con-
3 currently, the roller 56, the battery weights and the pivot arm 52 swing away from their original fore and aft orientation, creating the tie rod 62, the clevises 44 and the front wheels 47 to move in a direction such as to oppose the initiating impulse and to swing the front end of the vehicle back toward the crest-line.

Ordinarily, upon approaching an equally straddling condition on the crest-line, the weights will creep back toward a central position so that there is a minimum of over-compensation, with attendant oscillation or "hunt-ing."

Even in the case of a track having a sort radius of curvature, in which situation the "feed-back" requires a continuous uphill steering by the front wheels, the corrective effort is achieved with but an imperceptible amount of oscillation in the heading of the vehicle.

What is claimed is:

1. A self-guiding toy vehicle device comprising:
   (a) an endless substantially triangular-in-section track, said section terminating in an arcuate central apex;  
   (b) an elongated frame;  
   (c) a pair of rear wheels rotatably mounted on said frame and adapted to span said apex;  
   (d) a fore and aft trunnion pivotally mounted on the forward end of said frame;  
   (e) a transverse truck member mounted on said trunnion for angular movement with respect to said frame about a fore and aft axis coinciding with the axis of said trunnion;  
   (f) a pair of front wheels rotatably mounted on the transverse ends of said truck member for simultaneous movement about both a substantially horizontal transverse axis and a substantially vertical axis; and  
   (g) gravitationally actuated means movably supported on said track and being responsive to said angular movement of said track about said fore and aft axis for steering said front wheels toward said apex as said gravitationally actuated means is gravitationally tilted away from said fore and aft axis.

2. A toy vehicle for use on an elongated track having a generally triangular cross section including an apex and a pair of down wardly and laterally inclined sides, said vehicle comprising:
   (a) a frame having its after end supported on track engaging wheels,  
   (b) a propelling member on said frame for driving said wheels;  
   (c) a truck pivotally mounted on the forward end of said frame for laterally inclined movement about a fore and aft axis;  
   (d) a pair of steering wheels rotatably mounted on the lateral ends of said truck and supporting said truck, said wheels being laterally angularly movable in unison with said track about said fore and aft axis;  
   (e) a gravitationally responsive member pivotally mounted and supported on said truck for lateral movement toward and away from said fore and aft axis in response to the lateral angular movement of said truck and said steering wheels with respect to said fore and aft axis; and  
   (f) means connected to said gravitationally responsive member and said steering wheels for turning said steering wheels in a direction opposed to the downward lateral inclination of said truck whereby said forward end of said frame is guided toward said apex of said track.

3. The device of claim 2 wherein said gravitationally responsive member includes a weight housing; a connecting member extending from said weight housing and terminating on said track for lateral angular movement in conjunction therewith; a roller member and a connecting member supported on said track to take of said lateral angular movement thereof as said steering wheels laterally incline in dependence upon the position of said steering wheels on said track.

4. A self-tracking toy vehicle device comprising:
   (a) an elongated frame supported on a pair of driven rear wheels and a pair of steerable front wheels;  
   (b) an electric motor on said frame for driving said rear wheels, said motor being energized by an electric battery on said vehicle;  
   (c) an elongated track having a triangular cross sectional configuration terminating centrally in an arcuate apex and being adapted to support said wheels on opposite sides of said apex;  
   (d) a truck member pivotally mounted on a horizontal fore and aft trunnion on the forward end of said frame;  
   (e) a steering linkage including a pair of clevises rotatably mounted on the lateral ends of said truck member for rotation of said clevises about a substantially vertical axis, said clevises having said front wheels rotatably mounted thereon, said linkage further including a transverse tie rod pivotally secured to said clevises for simultaneous and equal angular movement thereof;  
   (f) a gravitationally responsive member including a fore and aft rod having a forward portion downwardly turned and rotatably mounted on said truck member for angular swinging movement of said rod in a substantially horizontal plane, the after end of said rod having said battery secured thereto as a weight, said fore and aft rod being swingingly connected to said transverse tie rod whereby lateral swinging movement of said weight and said fore and aft rod produces a transverse movement of said linkage and angular motion of said clevises and said front wheels.

5. A toy vehicle comprising:
   (a) a generally horizontal frame, said frame being elongated in a fore and aft direction;  
   (b) a truck pivotally mounted adjacent the forward end of said frame for lateral tilting movement about a central, generally horizontal, fore and aft axis;  
   (c) a clevis means rotatably mounted on the lateral ends of said truck for rotation about a generally vertical axis;  
   (d) steering wheels rotatably mounted on said clevis means on said lateral ends of said truck for rotation about a transverse, generally horizontal axis, said wheels being capable of partaking of the lateral tilting movement of said truck about said central, generally horizontal, fore and aft axis and being capable of partaking of the rotational movement of said clevis means about said generally vertical axis;  
   (e) a gravitationally actuated member supported on said truck and being movable therewith; and  
   (f) means connecting said clevis means and said gravitationally actuated member supported on said track for angularly rotating said clevis means and said steering wheels about said generally vertical axis concurrently with a lateral tilting movement of said truck, the direction of angular rotation of said clevis means being such as to head the lower of said wheels in a direction generally toward the forward extension of said central, generally horizontal, fore and aft axis.

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