This invention relates to new and useful improvements in toys and the primary object of the present invention is to provide a novel and improved electrically propelled vehicle and an endless track or runway therefor.

Another important object of the present invention is to provide an electrically propelled vehicle including an electric motor carried thereby, a pair of conductive rails, and novel and improved means for electrically connecting the rails to the electric motor for propelling the vehicle on the rails.

A further object of the present invention is to provide a toy electric vehicle and track including a runway having a pair of conductive rails enclosed therein, rollers frictionally engaging the rails, and guide means between the rollers and the electrically propelled vehicle slidably engaging a continuous guideway formed in the runway.

A still further object of the present invention is to provide a toy electric vehicle and track of the aforementioned character that is simple and practical in construction, strong and reliable in use, small and compact in structure, safe and efficient in use, neat and attractive in appearance, relatively inexpensive to manufacture, and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereininafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a top plan view of the present electric vehicle and track, and with parts of the track broken away and shown in section:

Figure 2 is a longitudinal vertical sectional view taken substantially on the plane of section line 2—2 of Figure 3:

Figure 3 is a transverse vertical sectional view taken substantially on the plane of broken section line 5—5 of Figure 2:

Figure 4 is a top plan view of the electric vehicle used in conjunction with the present invention, and showing the body portion removed therefrom:

Figure 5 is a fragmentary longitudinal horizontal sectional view taken substantially on the plane of section line 5—5 of Figure 2:

Figure 6 is a group perspective view of a pair of adjacent track sections in a separated position;

Figure 7 is a detailed vertical sectional view showing the rail-engaging rollers of one vehicle engaged upon the non-conductive finger of another vehicle.

Referring now to the drawings in detail, wherein for the purpose of illustration, there is disclosed a preferred embodiment of the present invention, the numeral 10 represents the track or runway that is used in conjunction with the present invention generally. This track 10 includes a plurality of straight sections 12 and a plurality of curved sections 14 which are so disposed as to form a continuous path or bearing surface for an electrically propelled vehicle that is designated generally by the numeral 16.

The sections 12 and 14 each include upper walls or bearing surfaces 16, lower walls or bearing surfaces 20, and side walls 22 and 24 integrally formed with the walls 16 and 20. Fixed to suitably insulated strips 25 on the inner face of each lower wall 20 is a pair of spaced parallel conductive rails 28 and 29. One end of each of the rails are formed with socket 30 and the remaining end of each of the rails is formed with a reduced tongue or extension 32 whereby adjacent sections may be connected to each other with the extensions 32 carried by one section engaging the sockets 30 of an adjacent section. The rails of one runway section, for example section 34, is connected to a pair of conductive wires 36 and 38 that lead to a suitable source of electric current such as a transformer T.

The electrically propelled vehicle 16 includes a base plate 40 having fixed thereto pairs of depending bearing ears 42 that rotatably support a rear driving axle 44 and a forward driven axle 46. Suitably fixed on the terminals of the rear axle 44, is a pair of rear wheels 48, and fixed on the terminals of the forward axle 46 is a pair of forward wheels 50. Extending through a suitable aperture 52 provided in the base plate 40, adjacent the forward axle 46, is the upper threaded end 54 of a depending forward conductive rod 56 which is held adjustable and fixed to the base plate 40 by a pair of nuts 58. The lower externally threaded end 60 of the rod 56 engages an aperture 62 provided in a substantially rectangular, non-conductive holding plate 64, and is held thereto through the medium of nuts 66.

Depending from the holding plate 64, are pairs of supporting posts 68 and 70 that engage conductive plates 72. These conductive plates 72 are integrally formed with pairs of spaced ears 74 and 75 that rotatably support conductive rollers 78 and 80 that engage the rails 28 and 29 respectively. Embracing each of the posts 68 and 70, and biased between the holding plate 64 and the plates 72, are coil springs 82 that urge the rollers 78 and 80 into frictional engagement with the rails 28 and 29.

Removably and adjustably secured by nuts or the like 84 to the base plate 40, adjacent the rear axle 44, is the upper threaded end 86 of a rear depending conductive rod 88 the lower threaded end 90 of which adjustably supports a pair of nuts 92 between which there is fixed one end of a non-conductive finger 94 that frictionally engages the rails 28 and 29.

Fixed on the base plate 40, is an electric motor 95 having a drive shaft 96. Integrally formed with the drive shaft 98, is a worm 100 that en-
gages a gear wheel 102 which is fixed on the rear axle 44. This electric motor 96 is provided with a pair of terminals 104 and 106 one of which, for example 104, is connected to the upper terminal 54 of the forward rod 56 by a conductive wire 108, and the remaining terminal 106 is connected by a conductive wire 110 to the upper end 86 of the rear rod 88.

It should be noted that the upper walls 18 of each of the runway sections 12 and 14 are provided with longitudinal slots or guideways 112 that slidably engage the rods 56 and 88. The roller 78 is fixed to a conductive wire 114 that is connected to the forward rod 56, and the roller 89 is fixed to a conductive wire 116 that is looped as at 118 about the forward rod 56 and is connected to the rear rod 88 to complete a circuit from the rails 26 and 28 to the motor 96.

In practical use of the present invention, the conductive wires 36 and 38 are preferably connected to a conventional transformer, of the type usually employed for electric trains, so that the current to the motor may be controlled for regulated speed or motion of the vehicle 16 about the runway 10.

Obviously additional sections of runway may be added to the shown sections so that a longer run of the vehicle may be maintained.

It should be noted that when there are a group of vehicles 16 on the track 10 and one of the vehicles becomes inoperative or stops, the rollers 80 of the vehicle behind or approaching the same will ride onto the finger 94 carried by the stopped vehicle, thus preventing harmful damage to the vehicle.

In view of the foregoing description taken in conjunction with the accompanying drawings it is believed that a clear understanding of the device will be quite apparent to those skilled in this art. A more detailed description is accordingly deemed unnecessary.

To be understood, however, that even though there is herein shown and described a preferred embodiment of the invention the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. A toy electric vehicle and track comprising a runway, a plurality of conductive rails carried by the runway and connected to a source of electric current, an electrically propelled vehicle, roller means engaging the rails, an electric motor carried by the vehicle for propelling the latter, means connecting the electric motor to the rails for energizing the former, and an insulator movable with the vehicle and riding upon the adjacent continuous portion of the rails adjacent the rear of the vehicle to form a ramp for the roller means of a vehicle trailing the first-mentioned vehicle.

2. A toy electric vehicle and track comprising a runway having an upper wall and a lower wall, a plurality of conductive rails carried by the lower wall of the runway and connected to a source of electric current, roller means engaging the rails, means urging the roller means into frictional engagement with the rails, a leading vehicle and a trailing vehicle secured to the roller means, an electric motor carried by each of the vehicles for propelling the same, means electrically connecting the rails to the electric motor and an insulator carried by the leading vehicle and riding upon the rails rearwardly of the leading vehicle to form a ramp for the roller means of the trailing vehicle.

3. A toy electric vehicle and track comprising a runway including a plurality of adjacent sections joined to form an endless bearing surface, a pair of conductive rails carried by the runways, means for connecting the rails of adjacent sections to each other, the rails of one section being connected to a source of electric current, a leading vehicle and a trailing vehicle, conductive roller means engaging the rails, an insulated holding plate associated with each vehicle, conductive rods connecting the holding plates to the vehicles, means urging the roller means from the holding plates and into frictional engagement with the rails, electric motors for propelling the vehicles, means electrically connecting the electric motor to the rails for energizing the former, and an insulator carried by and trailing the leading vehicle, said insulator riding upon the rails and adapted to receive the roller means of the trailing vehicle to prevent the trailing vehicle from contacting the leading vehicle.

4. In a toy electric vehicle and track including a runway, a pair of conductive rails carried by the runway and connected to a source of electric current, a leading vehicle mounted upon the runway, first rollers connected to the leading vehicle and riding on the rails, a trailing vehicle mounted on the runway, second rollers connected to the trailing vehicle and riding on the rails, and means for moving each of the vehicles on the runway, said means comprising an electric motor mounted on each vehicle and connected to the rollers; a non-conductive finger carried by the leading vehicle and riding on the rails rearwardly of the leading vehicle, said finger forming a means for receiving the first rollers to break the circuit to the motor carried by the trailing vehicle and to prevent the trailing vehicle from contacting the leading vehicle.

5. A toy vehicle and track comprising a runway, a plurality of conductive rails carried by the runway and connected to a source of electric current, a vehicle mounted on the runway, an electric motor carried by the vehicle for propelling the latter, said runway having a guide slot therein, a forward rod depending from the vehicle and slidably received in the guide slot, said rod being connected to one terminal of the motor, a non-conductive support carried by said forward rod and spaced above the rails, supporting posts depending from said support, conductive plates slidably received on said posts, rollers on said plates and riding on said rails, spring means on said posts yieldingly urging said rollers against said rails, a rear rod depending from the vehicle and slidably received in said guide slot, said rear rod being electrically connected to said forward rod and the remaining terminal of said motor, and a non-conductive finger secured to the rear rod and riding upon the rails rearwardly of the vehicle.

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REFERENCES CITED

The following references are of record in the file of this patent:

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,607,723</td>
<td>Avery</td>
<td>Sept. 9, 1924</td>
</tr>
<tr>
<td>1,608,691</td>
<td>Boyer</td>
<td>Nov. 9, 1926</td>
</tr>
<tr>
<td>1,700,640</td>
<td>Mangels</td>
<td>Jan. 29, 1929</td>
</tr>
</tbody>
</table>