Oct. 23, 1945. L. B. GREEN 2,387,578

MINIATURE RAILWAY

Filed May 25, 1944 3 Sheets-Sheet 1

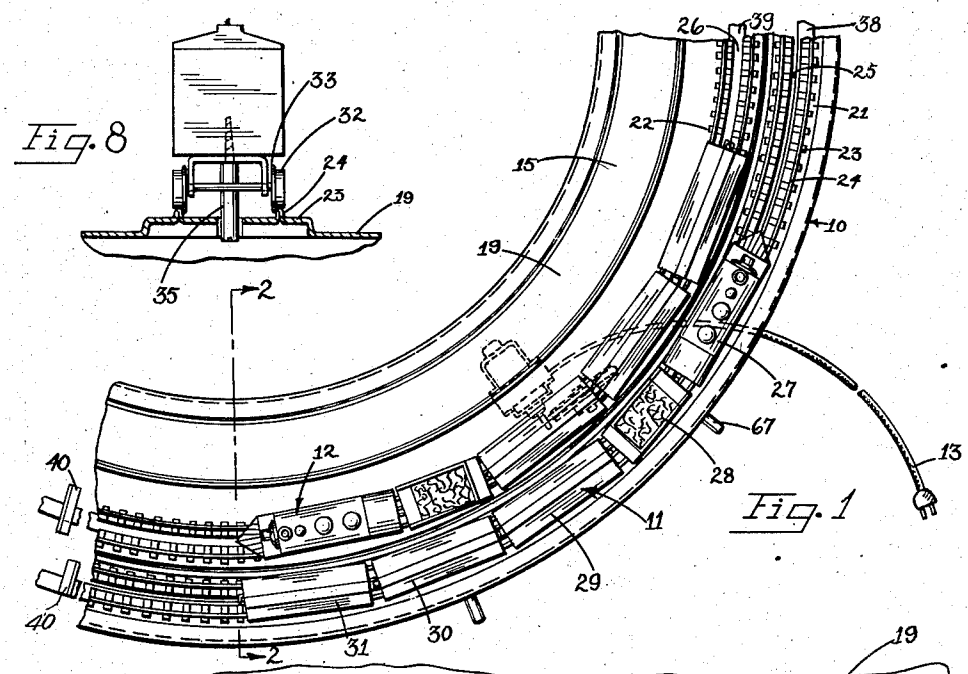


Fig. 8

Fig. 1

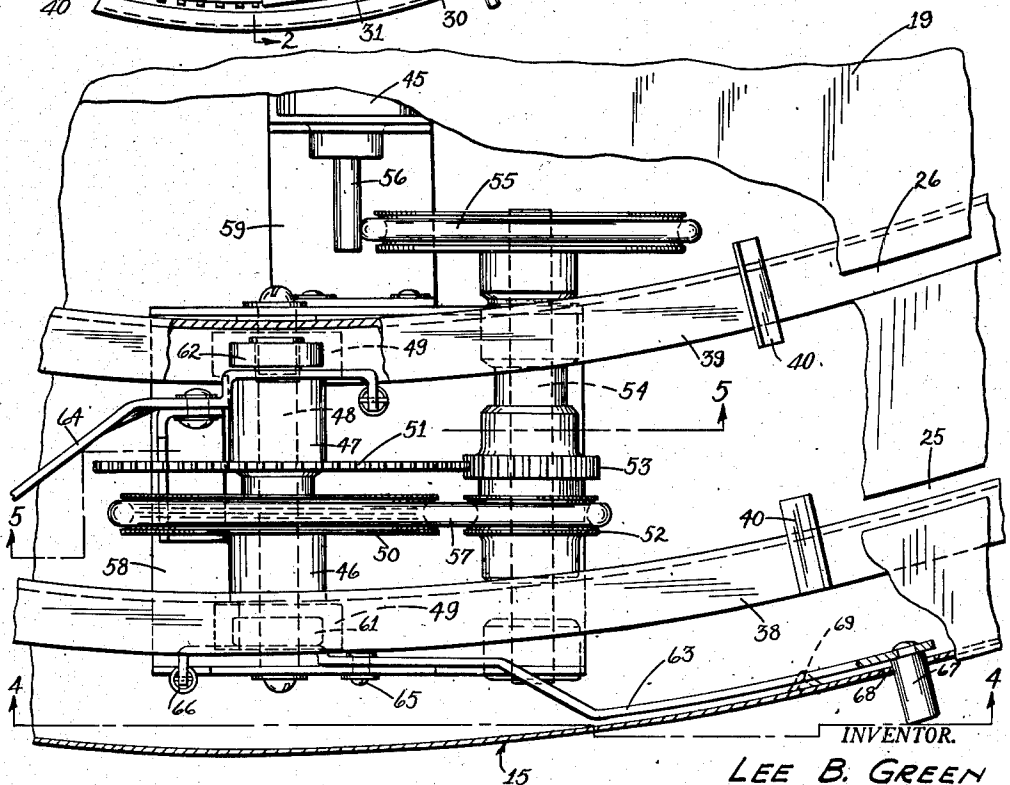


Fig. 3

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MINIATURE RAILWAY

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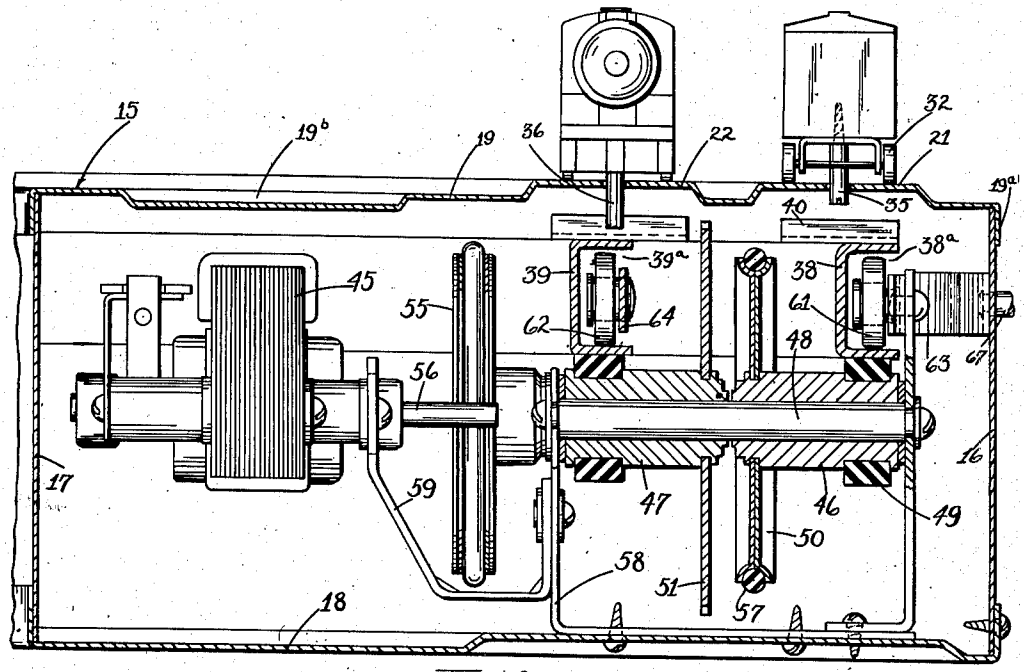


Fig. 2

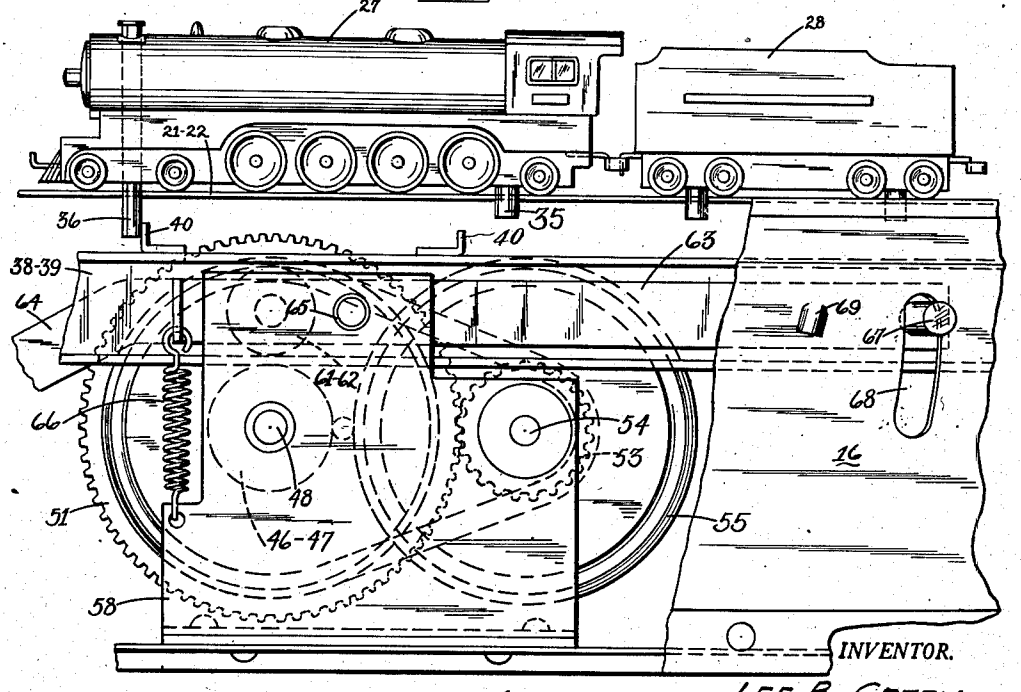


Fig. 4

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MINIATURE RAILWAY

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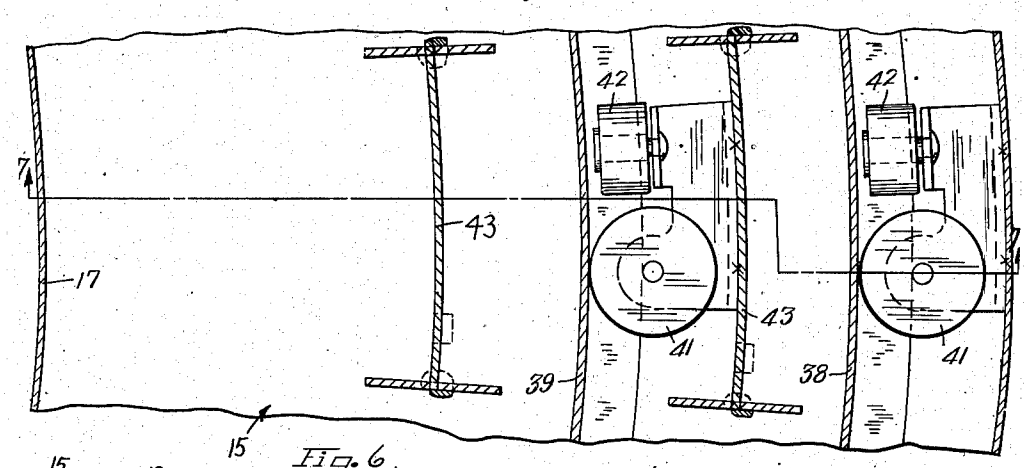


Fig. 6.

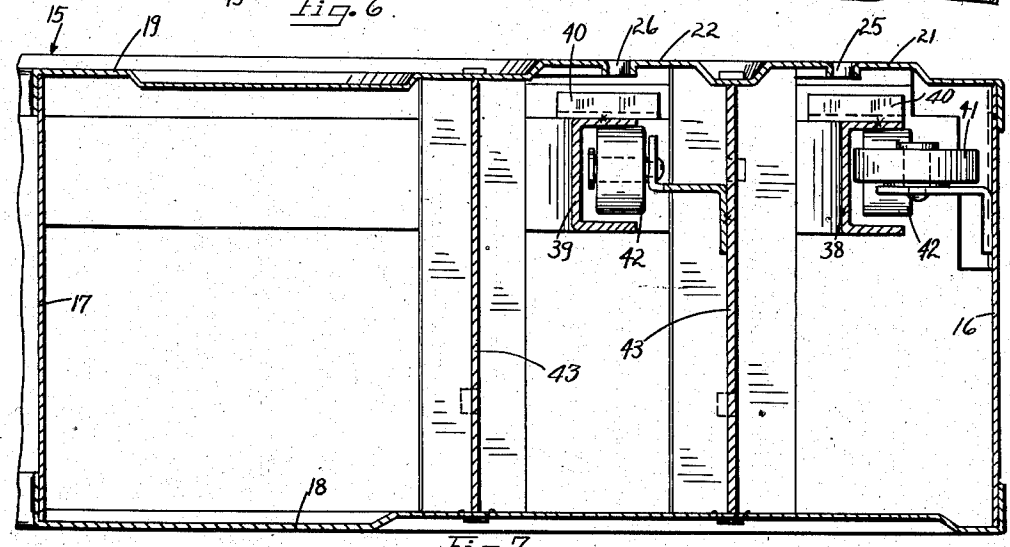


Fig. 7

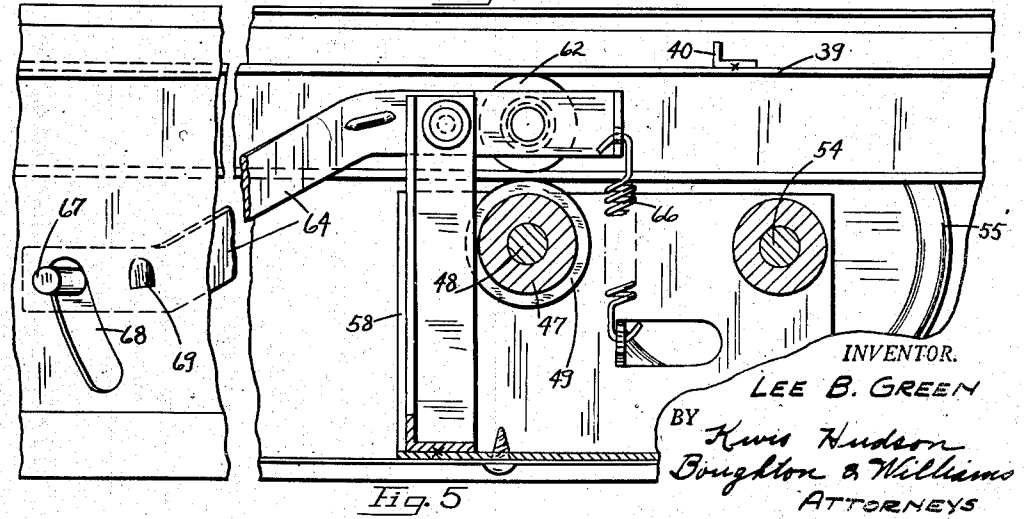


Fig. 5

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Patented Oct. 23, 1945

2,387,578

UNITED STATES PATENT OFFICE

2,387,578

MINIATURE RAILWAY

Lee B. Green, Lakewood, Ohio

Application May 25, 1944, Serial No. 537,282

7 Claims. (Cl. 46—216)

This invention relates to toy railways and the like, and aims to provide a novel toy or miniature railway in the form of a self-contained hollow unit having a track or runway along which a vehicle is moved by propelling means contained in such unit.

Another object of the invention is to provide a novel construction for a miniature railway or the like, in which an endless track or runway is used and a propelling means located beneath the runway includes an endless driving member which is movable in substantially its own plane and along the runway and is accessible through an endless slot co-extensive with the runway.

Still another object of the present invention is to provide a miniature railway of the character mentioned, in which novel means is employed for actuating and controlling the driving member so as to obtain a desired operation of the vehicles along the runway.

A further object of this invention is to provide a toy or miniature railway of the character mentioned, in which the driving member is a flanged ring and in which the means employed for actuating the ring includes friction and pressure rollers engageable with the ring.

Other objects and advantages of the invention will be apparent from the following description when taken in conjunction with the acompanying sheets of drawings in which

Fig. 1 is a partial plan view of a miniature railway embodying the present invention;

Fig. 2 is a transverse sectional view, on a somewhat larger scale, taken on line 2—2 of Fig. 1;

Fig. 3 is a partial plan view, with portions thereof broken away, showing the mechanism for driving the vehicle actuating members;

Fig. 4 is a side elevation with portions broken away, the view being taken as indicated by line 4—4 of Fig. 3;

Fig. 5 is a partial vertical sectional view taken on line 5—5 of Fig. 3 and further illustrating the driving means;

Fig. 6 is a partial plan view showing the means for supporting and guiding the vehicle driving members;

Fig. 7 is a transverse sectional view taken on line 7—7 of Fig. 6 and further illustrating the supporting and guiding means; and

Fig. 8 is a partial transverse sectional view further illustrating the construction of the track or runway.

Proceeding now with a more detailed description of the invention and referring to the particular embodiment shown in the drawings, it will be observed that my miniature railway is in the form of a self-contained unit 10 in which there are no loose or separate parts other than the cars or vehicles comprising the trains 11 and 12. The unit 10 can be easily moved from place to place and can be put into operation in any desired location merely upon plugging in the electric cord 13 and does not require any preliminary work of assembling track sections or other loose parts.

The unit 10 comprises an endles hollow structure 15 defining a closed loop or ring and having spaced inner and outer curved side walls 16 and 17, a bottom 18 and a top 19. The top 19 may be in the form of a generally flat plate or pan which forms a cover for the hollow structure 15 and has edge flanges 19a which extend downwardly along the sides 16 and 17. The top 19 is provided with relatively elevated portions or strips extending therealong and defining a pair of spaced tracks or runways 21 and 22 along which the trains 11 and 12 are movable. In addition to the runways 21 and 22 the top 19 may also include a pan or table section 19b on which various toys or articles can be placed.

The tracks or runways 21 and 22 include longitudinally rows of spaced cross-ties 23 and a pair of laterally spaced rails 24 on each row of ties. The ties 23 and the rails 24 can be printed or lithographed directly on the relatively elevated strips of the top 19 or can be printed on paper or other sheet material which is glued or otherwise attached to said strips or, as shown in Fig. 8 of the drawings, can be stamped or impressed in the metal or other sheet material of which the top or cover 19 is constructed. The tracks or runways 21 and 22 extend around the top 19 in the form of closed or endless loops so that the trains 11 and 12 can operate continuously on such co-extending runways without interfering with each other. The runways 21 and 22 are provided, respectively, with slots 25 and 26 extending therealong, preferably at a point between the rails 24 and the purpose of which slots will be presently explained.

The trains 11 and 12 may comprise one or more cars or vehicles which can be of any desired type. In this instance, I show the trains 11 and 12 as comprising a group of railway vehicles including a locomotive 27 having a tender 28, and a series of cars 29, 30 and 31 coupled to each other and to the tender of the locomotive. The cars or vehicles may be of any suitable construction and are provided with wheels 32 by which the cars are operably supported on the runways 21 and 22. When the track is glued, printed or

lithographed on the runways, as mentioned above, the wheels 32 are preferably not flanged wheels, but have flat treads which operate on the flat surfaces of the runways. When the track is of a construction having upstanding rails, as explained above and shown in Fig. 8, the wheels of the cars preferably have flanges 33 thereon.

The cars or vehicles comprising the trains 11 and 12 are retained on the runways 21 and 22 by means of pins 35 carried by such cars and extending downwardly therefrom through the slots 25 and 26. Each of the cars is provided with one or more of such pins as may be needed for retaining the cars on the runways during travel of the trains around the closed loops. During such travel of the trains the slots 25 serve as guide-ways along which the pins 35 move. When the vehicles are provided with flanged wheels for operation on upstanding rails, as shown in Fig. 8, such flanges assist the pins 35 in retaining the cars on the runways although, if desired, the retaining pins 35 can be omitted when such flanged wheels are employed. At least one of the pins of each of the trains 11 and 12, in this instance the foremost pin 36 of the locomotive 27, is of relatively greater length and extends downwardly through the slot a sufficient distance for cooperation with a movable propelling means housed in the hollow structure 15 and which propelling means will now be described in detail.

The propelling means for the trains 11 and 12 includes driving members 38 and 39 located beneath the respective tracks or runways 21 and 22, and which driving members carry lugs or cleats 40 which are engageable with the driving pins 36 for propelling the trains or vehicles along the runways. The driving members 38 and 39 are in the form of endless members or closed loops which are substantially co-extensive with the slots 25 and 26 of the respective runways 21 and 22. These driving members are preferably, though not necessarily, substantially rigid bars or rings of substantially channel-shaped cross-section as shown in the drawings, and are disposed with their channel recesses 38*a* and 39*a* opening laterally.

The driving members 38 and 39 are suitably supported in the hollow structure 15 for endwise movement or rotation and, for this purpose, I show (see Figs. 6 and 7) pairs of supporting and guiding rollers 41 and 42. The rollers 41 and 42 are mounted on the hollow structure 15 so as to lie on the convex side of the driving rings or loops 38 and 39 and are preferably disposed so that both rollers operate in the channel recess with one roller engaging the inner face of the upper flange and the other roller engaging the inner face of the connecting web. The rollers 41 and 42 which support and guide the driving member 38 can be mounted on the side wall 16 of the hollow structure 15 and the rollers which support the driving member 39 can be mounted on brackets or struts 43 which are provided in the hollow structure 15 and connect the top 19 with the floor or bottom 18 thereof. These rollers are preferably made of a material, such as resilient rubber, which will enable the driving members 38 and 39 to operate in a smooth and substantially noiseless manner. It will be understood, of course, that the pairs of supporting and guiding rollers 41 and 42 will be provided in suitable number and will be located at appropriately spaced points around the unit so that the driving members 38 and 39 will be maintained in the desired position immediately beneath the slots 25 and 26 during the rotation or endwise movement of such driving members. It will also be seen that when the driving members 38 and 39 are supported in this manner they will be confined for movement substantially in their own planes.

For actuating the driving members 38 and 39 I provide a suitable power device, such as the electric motor 45 shown in this instance and to which energizing current is supplied by the cord 13. The motor 45 is located in the hollow structure 15 so as to be concealed thereby and shielded from tampering by children or other persons operating the railway. The driving members 38 and 39 extend over or across a pair of driving rollers 46 and 47 which are disposed transversely to the path of movement of the driving members and are mounted on a shaft or spindle 48 for rotation independently of each other. Each of the rollers 46 and 47 includes a sleeve or hub rotatable on such shaft and carrying a rim 49 formed of resilient rubber or other suitable material which will provide a suitable friction driving surface. The friction rims 49 of the driving rollers 46 and 47 are engaged by the lower flanges of the driving members 38 and 39 so that a driving connection for the latter will be established when the latter are pressed against the friction rims and will be released or disengaged when such pressure is removed.

It is desirable to have the trains 11 and 12 run in opposite directions on the runways 21 and 22 and therefore the driving rollers 46 and 47 are rotated in opposite directions. For connecting the rollers 46 and 47 with the electric motor 45 so that the rollers will be driven in opposite directions I provide a pulley 50 on one of the rollers, in this instance the roller 46, and a gear 51 on the roller 47 and which pulley and gear cooperate respectively with a pulley and gear 52 and 53 carried by a counter-shaft 54. The counter-shaft 54 is provided at its inner end with a friction-surfaced wheel 55 with which the shaft 56 of the electric motor 45 has driving engagement. The pulley 50 is connected with the pulley 52 by a suitable belt 57 extending thereabout. The driving rollers 46 and 47, the counter-shaft 54 and the electric motor 45 constitute a power unit having a U-shaped frame 58 in which the shaft 48 and the counter-shaft 54 are suitably mounted. A bracket 59 connected with the frame 58 supports the electric motor 45 in driving relation to the wheel 55 of the counter-shaft 54.

For pressing the driving members 38 and 39 against the driving rollers 46 and 47 as mentioned above, I provide a pair of pressure rollers 61 and 62 which are located respectively in the channel recesses of the driving members and are carried by control levers 63 and 64. The control lever 63 serves the track or runway 21 and is pivoted at an intermediate point thereof on the frame 58 by means of the pivot pin 65. A tension spring 66 connected with the inner end of the lever 63 acts to pull the roller 61 downwardly to thereby press the driving member 38 into engagement with the friction ring 49 of the roller 46.

The control lever 63 is provided at its outer end with a handle or knob 67 which projects through a slot 68 of the hollow structure 15 so as to be accessible from the exterior of such structure. A locking lug 69 provided on the structure 15 is adapted to be engaged by the lever for

holding the latter with the roller 61 in a position to release or disengage the driving member 38 from the driving roller 46. When the driving member 38 is to be connected with the roller 46 to be driven thereby the lever 63 is sprung inwardly to permit it to be moved past the locking lug 69 whereupon the spring 66 causes the roller 61 to press the driving member 38 against the roller 46.

The control lever 64 carries the pressure roller 62 and serves the runway 22. The lever 64 has a projecting handle 67 thereon and can be actuated in the manner just explained for the lever 63 for causing the driving connection between the member 39 and the roller 47 to be established or released. The driving members 38 and 39 can thus be actuated simultaneously or individually for obtaining the desired propulsion of the trains 11 and 12. The electric motor 45 is preferably is reversible motor so that the trains can be made to travel in a reverse direction if this is desirable.

From the foregoing description and the accompanying drawings it will now be readily understood that I have provided a simple, safe and compact toy or miniature railway which is in the form of a self-contained unit and can be conveniently moved to any desired place of operation. It will be seen also that there are no track sections or other loose parts required to be assembled other than the vehicles which are to operate on the runways. It will be seen further that my miniature railway will operate in a quiet, efficient and satisfactory manner and comprises an instructive and entertaining apparatus.

While I have illustrated and described my miniature railway in considerable detail, it will be understood, of course, that I do not wish to be correspondingly limited but regard my invention as including all changes and modifications coming within the spirit of the invention and the scope of the appended claims.

Having thus described my invention, I claim:

1. A miniature railway or the like comprising a support having a runway thereon in the form of a closed loop and also having a slot therein extending as a closed loop along said runway, a wheeled vehicle supported on said runway and adapted to travel therealong, a driving member in the form of a closed loop located beneath said runway and substantially coextensive with said slot, said driving member comprising a bar having angularly disposed continuous longitudinal web and flange portions, means mounting and guiding said member for movement along said slot and substantially in its own plane comprising rollers carried by said support and engaging said web and flange portions, means for imparting such movement to said member, and means for establishing a driving connection between said member and vehicle through said slot.

2. A miniature railway or the like comprising a support having a runway thereon in the form of a closed loop and also having a slot therein extending as a closed loop along said runway, a wheeled vehicle supported on said runway and adapted to travel therealong, a driving member in the form of a closed loop located beneath said runway, said driving member comprising a bar having angularly disposed continuous longitudinal web and flange portions, means mounting said member for movement along said slot and substantially in its own plane comprising rollers carried by said support and engaging said web and flange portions, a driving roller extending transversely beneath said member and having friction means thereon, means for rotating said roller, means for pressing said member against said driving roller to be driven thereby, and means for establishing a driving connection between said member and vehicle through said slot.

3. A miniature railway or the like comprising a support having a runway thereon in the form of a closed loop and also having a slot therein extending as a closed loop along said runway, a wheeled vehicle supported on said runway and adapted to travel therealong, a driving bar in the form of a closed loop located beneath said runway, means mounting said bar for movement along said slot and substantially in its own plane, said bar being of channel-shaped cross-section with a channel recess therein, a driving roller extending transversely beneath said bar and having friction means thereon, means for rotating said roller, means extending into said channel recess for pressing said bar against said roller to be driven thereby, and means for establishing a driving connection between said bar and vehicle through said slot.

4. A miniature railway or the like comprising a support having a pair of substantially parallel runways thereon in the form of closed loops and also having slots therein extending as closed loops along the respective runways, a wheeled vehicle supported on each runway and adapted to travel therealong, a driving bar in the form of a closed loop located beneath each runway, rollers carried by said support and located at spaced points along said runway for mouting such bars for movement in a common plane along their respective slots, a frictional driving roller beneath each bar, a shaft adjacent said driving rollers, a power device connected with said shaft, means connecting said driving rollers with said shaft to be driven thereby in opposite directions, means for pressing the bars against their respective driving rollers, and means for establishing a driving connection between the vehicles and their respective driving bars through said slots.

5. A miniature railway or the like comprising an endless hollow structure having a generally flat top, said top having a runway thereon in the form of a closed loop and a slot in the form of a closed loop substantially coextensive with said runway, guide rollers located below said runway and spaced along said slot, an endless driving member located below said runway and supported by said rollers for movement along said slot and substantially in its own plane, said driving member comprising a bar having angularly disposed continuous longitudinal web and flange portions and said guide rollers comprising pairs of rollers engaging the respective web and flange portions of said bar and rotatable about relatively angularly disposed axes, a continuously driven element adjacent said member, and means adapted to be actuated from the exterior of said hollow structure for establishing or releasing a driving connection between said member and element.

6. A miniature railway or the like comprising an endless hollow structure having a generally flat top, said top having a runway thereon in the form of a closed loop and a slot in the form of a closed loop substantially coextensive with said runway, guide rollers located below said runway and spaced along said slot, an endless driving member located below said runway and supported by said rollers for movement along said slot and substantially in its own plane, said member being of substantially channel-shaped cross-section and disposed with its channel recess opening laterally

thereof, a continuously driven friction roller adjacent said member, and means adapted to be actuated from the exterior of said hollow structure for establishing or releasing a driving connection between said member and element including a lever and a pressure roller disposed in said recess and actuated by said lever for pressing said member against said friction roller.

7. A miniature railway or the like comprising a support having a substantially flat sheet metal runway thereon and also having a slot therein extending along said runway, a wheeled vehicle supported on said runway and adapted to travel therealong, said runway having a track composed of rails and ties stamped into said sheet metal, depending elements carried by said vehicle and extending into said slot for retaining the vehicle on said runway in operative relation to said track, and driving means movable along said runway beneath said support and engageable with one of said elements for propelling said vehicle.

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