May 3, 1927.

R. DE FILIPPIS

1,627,150

TOY VEHICLE

Filed July 10, 1925

Fig. 1

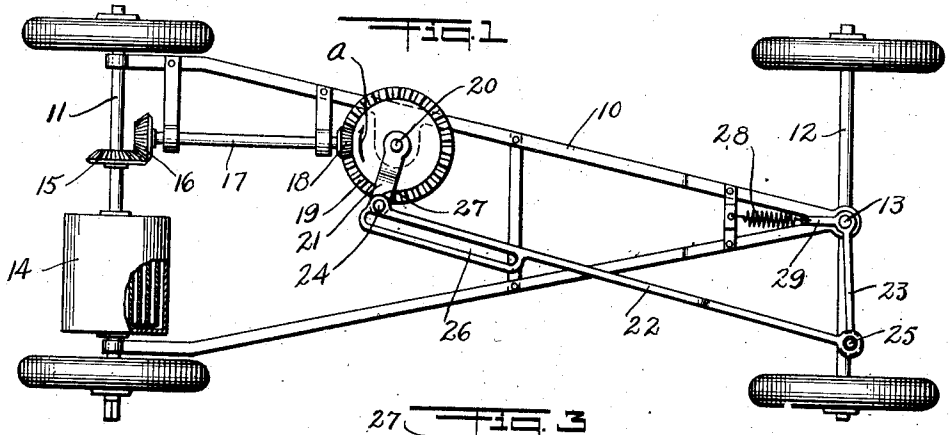


Fig. 3

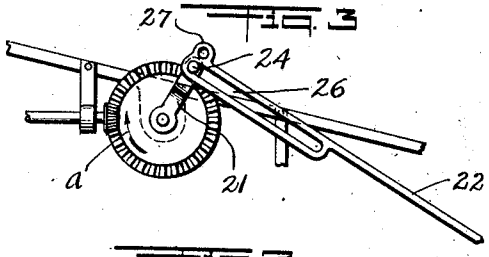


Fig. 2

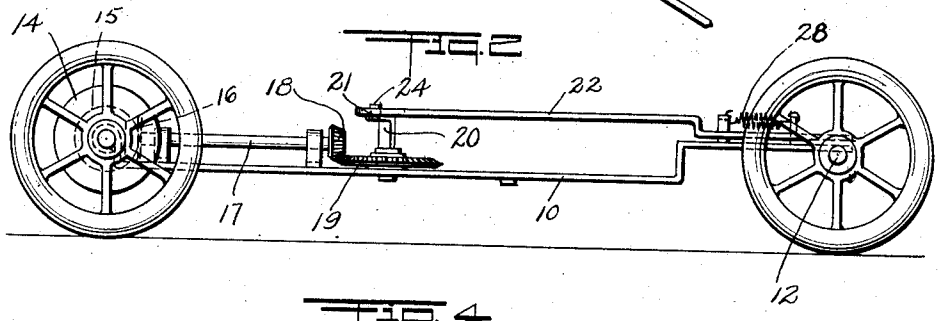


Fig. 4

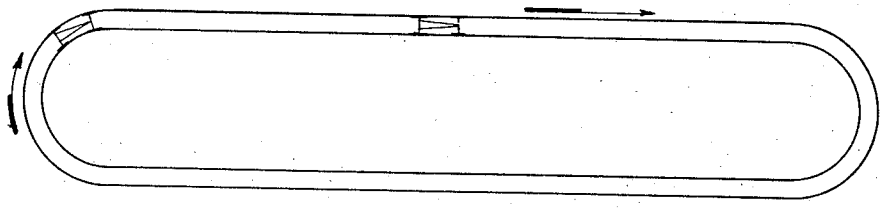
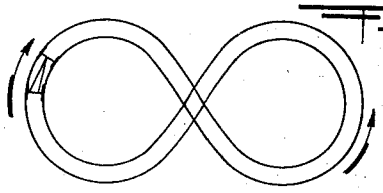


Fig. 5



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UNITED STATES PATENT OFFICE.

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TOY VEHICLE.

Application filed July 10, 1925. Serial No. 42,669.

This invention relates to toy vehicles and has particular reference to devices of that general nature which are arranged for travel along a predetermined path.

Among the objects of this invention is to provide a toy vehicle or the like comprising mechanism which is operative for automatically steering the vehicle so that the same may travel along any predetermined path and describe any particular figure as desired.

Another object of this invention is to provide a toy vehicle or the like comprising mechanism which may be constructed in a simple and inexpensive manner and which is operative for changing the direction of travel of the device in any predetermined manner as desired.

With the foregoing and other objects in view the invention consists in the arrangement and combination of parts hereinafter described and claimed, and while the invention is not restricted to the exact details of construction disclosed or suggested herein, still for the purpose of illustrating a practical embodiment thereof reference is had to the accompanying drawings in which like reference characters designate the same parts in the several views, and in which—

Figure 1 is a plan view showing the frame of the vehicle and the operating mechanism.

Fig. 2 is a side elevation of the same.

Fig. 3 is a fractional view showing a portion of the operating mechanism arranged in a different position so that the vehicle may travel along a different line of motion.

Fig. 4 is a diagrammatic view illustrating the path described by the vehicle when the operating mechanism is arranged as shown in Fig. 3.

Fig. 5 is a diagrammatic view of the path pursued by said vehicle when the operating mechanism is arranged as shown in Fig. 1.

Referring now more specifically to the drawings I show my toy vehicle as comprising a frame 10 which is mounted upon a plurality of wheels certain of which are secured rotatably upon an axle 11 which is journaled in fixed relation to the frame, while the forward wheels of which are mounted upon an axle 12 which is arranged for relative movement about a vertical axis as fixed by the pin 13 and whereby the vehicle may be steered in a conventional manner.

The device may be propelled in any suitable manner as, for instance, manually, or by means of a spring wound mechanism 14 or the like which has suitable engagement for this purpose with the rear axle 11 so as to rotate the rear wheels and cause the device to travel. A bevel gear 15 is mounted in engagement upon said rear axle and meshes with another bevel gear 16 which is supported upon a shaft 17 journaled upon the frame. At the other end of the shaft 17 a bevel gear 18 is mounted so as to engage a fourth bevel gear 19 which is journaled upon the frame as by means of a pin 20. The bevel gear 19 is rotatable when the device is caused to travel and is operative as by means of the pin 20 to cause rotation of a rotary member 21. Said rotary member has engagement with the front axle 12 as by means of a link 22, said link having engagement with a lever 23 which is secured to the pin 13 whereby when the member 21 is caused to rotate an oscillatory motion is imparted to the front axle by means of said link and the vehicle is caused to describe a figure 8 in its travel as shown in Fig. 5. The link 22 may for this purpose be of any suitable form or construction but preferably it is arranged in the form of a thin metal member which is pivotally joined to said rotary member as by means of a pin 24 and to the lever 23 as by means of a pin 25.

With the operating mechanism arranged as shown in Fig. 1, it will be observed that with the rotary member moving in the direction of arrow *a*, the vehicle is due to execute a right turn. After the rotary member has described an angle of 90° from the position shown the vehicle begins to straighten its line of motion, and after another turn of 90° the front axle is back again to the position shown in Fig. 1. As the rotary member, however, continues its rotation in the direction of arrow *a* for the remaining 180°, the device will execute a left hand turn and then straighten again in its line of motion as the operating mechanism comes back to the position shown in Fig. 1. It will be observed that the result of forming such consecutive right and left hand turns is that the vehicle will describe a figure 8.

Means are provided co-operating with the front axle and the rotary parts of the mechanism whereby the vehicle may be caused to describe another figure as desired and such means may, for the sake of simplicity, take

the form of a link which is arranged for lost motion engagement with one of its co-operating parts. More specifically, the link 22 is provided with a loop 26 which may be engaged with the pin 24 as shown in Fig. 3, the eye 27 being readily disengaged from said pin and lying at a side of the link in readiness to be again engaged with the pin should the operator again desire that the vehicle describe a figure 8. However, with the loop in engagement with the pin as aforesaid the vehicle will describe a figure 0 or the like as shown in Fig. 4. Thus with the rotary member 21 moving in the direction of arrow *a* as shown in Fig. 3, the front axle will be in normal position at right angles to the axis of the frame for straight forward travel of the vehicle, but as the rotary member 21 continues its rotation, the front axle will be caused to retain its position as by automatic means such as a resilient member 28 which is secured to the frame at one end, and at its other end to a lever 29 having fixed engagement with the pin 13. The normal effect of the spring 28 is to retain the front axle for a straight forward drive of the vehicle. The result will be as the rotary member 21 continues its movement in the direction of arrow *a*, that the pin 24 will move idly along the loop 26, the link 22 being motionless in that position except for an angular movement toward the axis of the vehicle. Thus the vehicle will continue to travel in a straight path until the rotary member has described an angle of 180° and has begun its rearward travel again so that the pin 24 will exert a pull upon the link 22 and cause the axle to turn against the pull of the resilient member 28. Thus the device will be caused to steer during the remaining half turn of the rotary member. Since the direction of steering is always the same the path described will be substantially that of a figure 0. It will thus be seen that I have provided a device comprising means for causing a toy vehicle or the like to move along a predetermined line of motion, said means comprising a connecting member for causing the front axle of a vehicle to turn for steering the device, said connecting member having fixed or lost motion engagement with one of its co-operating members and more particularly with a rotary member which is caused to rotate in any suitable manner when the device is propelled.

I claim:

1. In a device of the class described, the combination with a frame having a plurality of wheels rotatably secured thereto, one of said wheels being mounted upon an axle which is movable to cause the device to travel circularly, means for propelling the device, a rotary member having engagement with a member that rotates when the device is made to travel along, whereby said member is caused to rotate, a link joining said axle and said rotary member to cause the axle to rotate about its vertical axis, and resilient means operative to return said axle to normal predetermined position, said link being provided with means for movably engaging said rotary member while the same is making one part of a rotation, and for fixedly engaging said member while the same is making another part of a rotation, said axle being returned to predetermined position by said resilient means while the rotary member has movable engagement with said means.

2. In a device of the class described, the combination with a frame having a plurality of wheels rotatably secured thereto, one of said wheels being mounted upon an axle which is movable to cause the device to travel circularly, means for propelling the device, a rotary member having engagement with a member that rotates when the device is made to travel along, whereby said member is caused to rotate, a link joining said axle and said rotary member to cause the axle to rotate about its vertical axis, and resilient means operative to return said axle to normal predetermined position, the engagement of said link and said rotary member comprising a loop connection in an end of which said rotary member has fixed engagement with the link during one part of a rotation, said rotary member having movable engagement with the link in another portion of the loop during another part of the rotation of said member, said axle being returned to predetermined position and retained therein by said resilient means while the rotary member has movable engagement with said loop connection.

In testimony whereof I affix my signature.

RAYMOND DE FILIPPIS.