J. CIAFFONE.

MECHANICAL TOY.

APPLICATION FILED JULY 19, 1916.

1,217,704.

Patented Feb. 27, 1917.

4 SHEETS—SHEET 1.

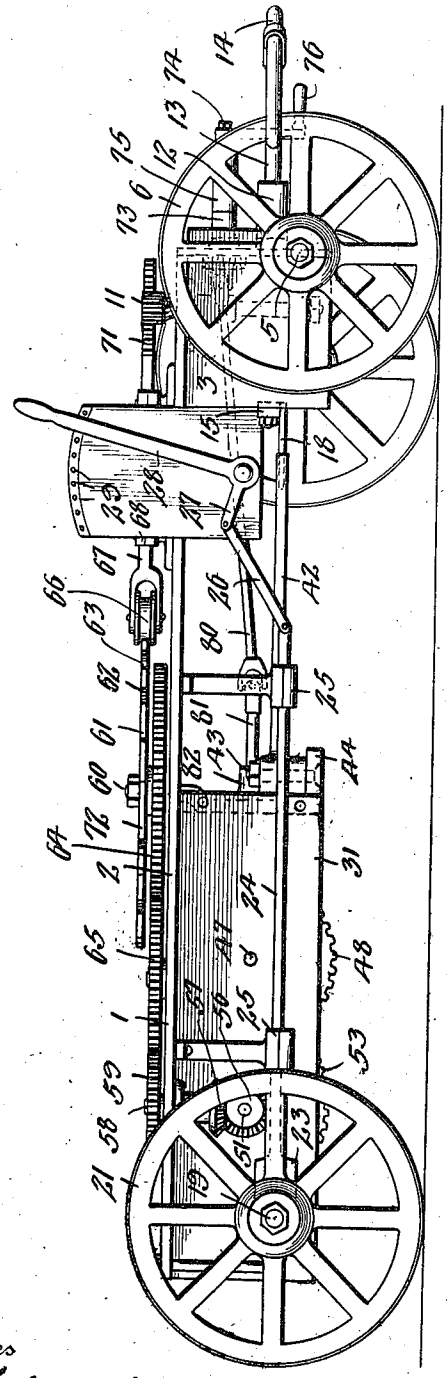


Fig. 1.

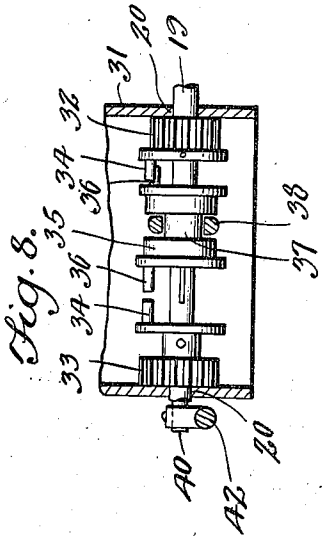


Fig. 8.

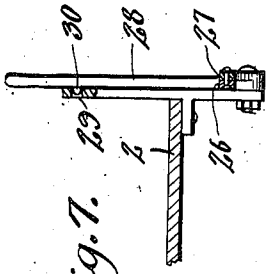


Fig. 7.

Witnesses

E. Andrews Jr.

Wm. J. Boardman

Inventor

J. Ciaffone,

By Victor J. Evans

Attorney

J. CIAFFONE.

MECHANICAL TOY.

APPLICATION FILED JULY 19, 1916.

1,217,704.

Patented Feb. 27, 1917.

4 SHEETS—SHEET 2.

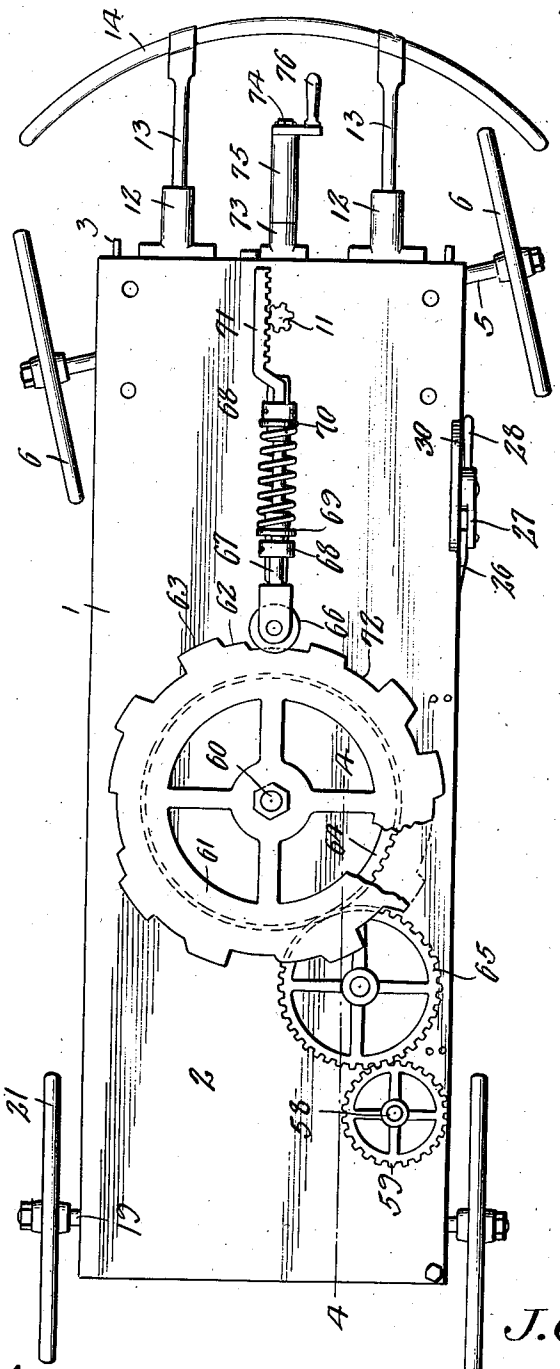


Fig. 2.

Witnesses

E. Chadwick Jr.

Thos. J. Fowler.

Inventor

J. Ciaffone,

By Victor J. Evans

Attorney

J. CIAFFONE.

MECHANICAL TOY.

APPLICATION FILED JULY 19, 1916.

1,217,704.

Patented Feb. 27, 1917.

4 SHEETS—SHEET 3.

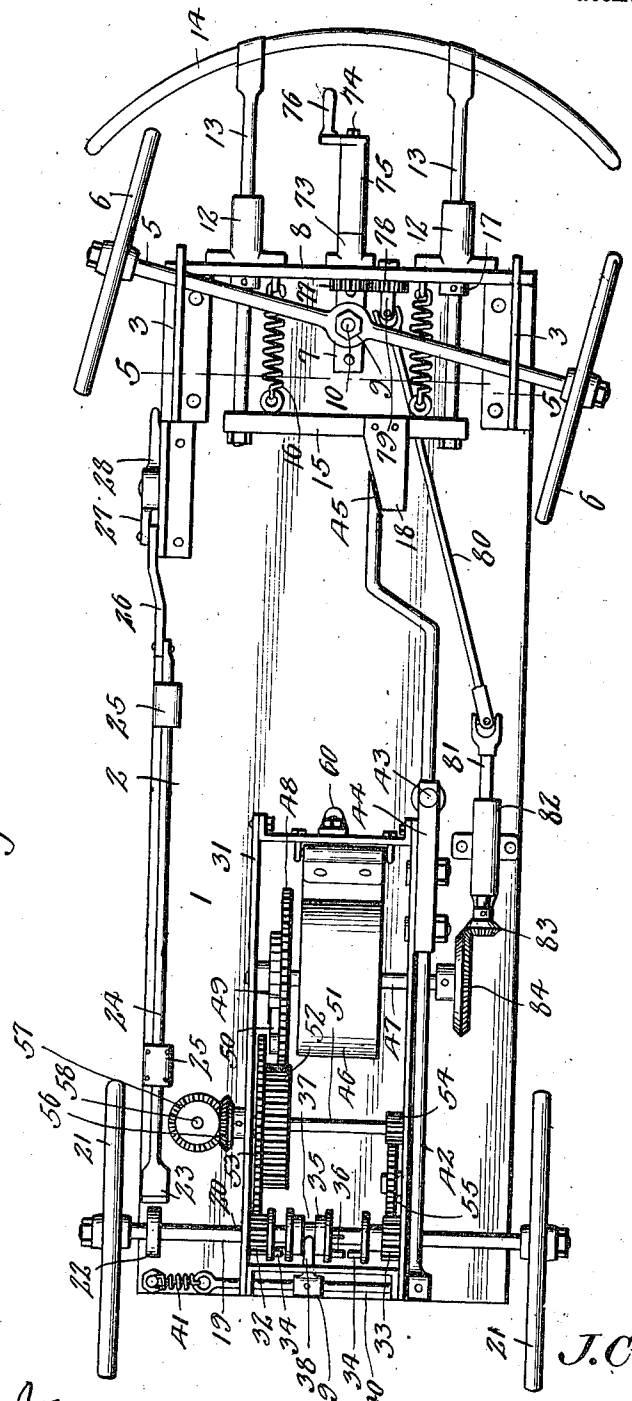


Fig. 3.

Witnesses

E. Adcock Jr.

W. J. Foerth

Inventor

J. Ciaffone

By Victor J. Evans

Attorney

J. CIAFFONE.

MECHANICAL TOY.

APPLICATION FILED JULY 19, 1916.

1,217,704.

Patented Feb. 27, 1917.

4 SHEETS—SHEET 4.

Fig. 4.

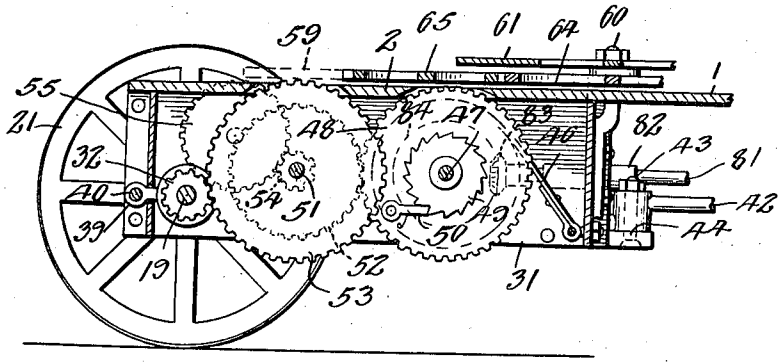


Fig. 5.

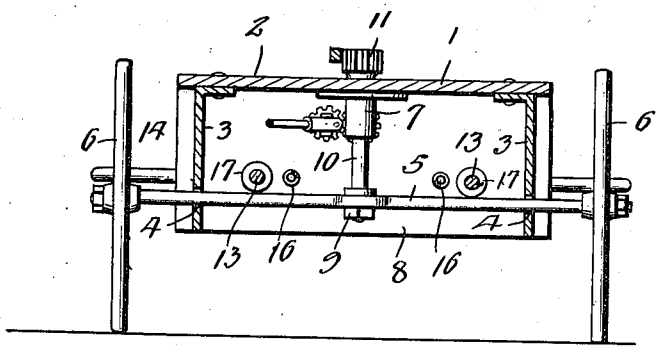
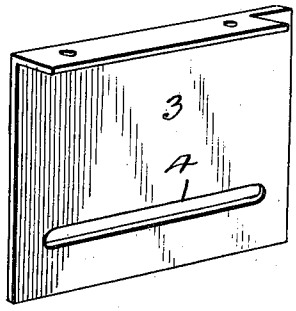


Fig. 6.



Witnesses

Inventor

J. Ciaffone,

By Victor J. Evans

Attorney

UNITED STATES PATENT OFFICE.

JAMES CIAFFONE, OF LONG ISLAND CITY, NEW YORK.

MECHANICAL TOY.

1,217,704. Specification of Letters Patent. Patented Feb. 27, 1917.

Application filed July 19, 1916. Serial No. 110,168.

To all whom it may concern:

Be it known that I, JAMES CIAFFONE, a citizen of the United States, residing at Long Island City, in the county of Queens and State of New York, have invented new and useful Improvements in Mechanical Toys, of which the following is a specification.

This invention relates to motor propelled vehicles and is primarily designed to provide a toy vehicle of this class wherein the motor will propel the vehicle at a desired speed and in a determined direction and wherein, should the vehicle meet with an obstruction, the motor will actuate to reverse the direction of travel of the same so as to back away from the vehicle and permit the vehicle to be again moved in a straight ahead direction, mechanism being employed for actuating the front axle to turn the wheels thereof so that the vehicle when again being propelled in a forward direction will avoid the obstruction.

A further object of the invention is to provide a mechanical toy comprising a wheeled body propelled by a motor which shall be subdivided and which when contacting with an obstruction will be propelled in a rearward direction and turned to avoid the obstruction when the vehicle is in its straight ahead direction of travel, wherein means are provided whereby the rate of speed of the vehicle may be readily regulated.

With the above and other objects in view the improvement resides in the construction, combination and arrangement of parts set forth in the following specification and falling within the scope of the appended claims.

In the drawings:

Figure 1 is a side elevation of a device constructed in accordance with the present invention,

Fig. 2 is a top plan view of the same,

Fig. 3 is a bottom plan view of the same,

Fig. 4 is a longitudinal sectional view approximately on the line 4—4 of Fig. 2,

Fig. 5 is a transverse sectional view approximately on the line 5—5 of Fig. 1,

Fig. 6 is a perspective view of one of the bracket members employed upon the device,

Fig. 7 is a detail sectional view approximately on the line 7—7 of Fig. 2, illustrating the manner in which the stud of the lever engages one of the apertures in the plate arranged to one of the sides of the device, and

Fig. 8 is an enlarged sectional view approximately on the line 8—8 of Fig. 3.

In constructing my improved motor propelled toy, it is to be understood that any desired material may be employed and that such shapes and proportions may be used as may be desired as the improvement is not necessarily restricted to that of a toy, but may be constructed of such a size as to permit of the same carrying passengers, in which event the body of the machine will be provided with suitable seats.

In the embodiment of the improvement as disclosed by the drawings, the body 1 is of a substantially rectangular construction and includes a flat top 2. The body, at the forward end thereof has secured thereto the flanges of depending bracket members 3, one of said brackets being arranged adjacent to each of the sides of the body and each of said brackets has its depending plate provided with an elongated opening 4. These openings aline and have passed therethrough the front axle 5, the ends of said axle having journaled thereon suitable wheels 6. The axle 5 is preferably centrally enlarged and is arranged upon a suitable support 7 that is secured to a plate 8, the said plate being connected to the front of the body and preferably secured to the outer edges of the brackets 3. Secured to the referred to central portion of the axle 5 and journaled in bearings in the support 7, and having its lower end provided with a lug or other retaining member 9 is the king pin for the axle. This pin 10 projects through a suitable bearing opening in the top 2 of the body and has secured to its upper end a pinion 11.

Secured to the front plate 8 and projecting outwardly therefrom is a pair of sleeve members 12, and passing through each of these sleeves is a rod member 13. The outer ends of these rods 13 have connected thereto a curved bar 14 which provides the bumper for the device. The opposite or

inner ends of the rods 13 are connected by a cross plate 15 and the said plate 15 is normally moved in the direction of the front plate 8 of the body through the medium of helical springs 16 which are connected to the said cross plate and to the inner face of the front plate 8, whereby the bumper will be normally retained a suitable distance in advance of the front of the body. The rods 13 are provided with stop members 17 which are adapted to contact with the inner face of the front plate 8 to limit the movement of the bars in an outward direction with relation to the frame or body. The connecting plate 15 has secured thereto a rearwardly extending cam member 18 and the purpose of this arrangement will be hereinafter fully set forth.

The rear axle 19 is journaled in suitable bearings 20 and has upon its ends the propelling wheels 21. The axle 19, inward of one of the wheels 21 is provided with a brake wheel or rim 22 which is adapted to be contacted by a brake shoe 23, the said shoe being preferably constructed of flexible material, such as rubber and the same having an arcuate face to snugly engage with the brake wheel or rim 22. The brake shoe is provided with a brake rod 24 which is mounted for longitudinal movement in suitable bearings 25, the free end of the rod having pivotally connected therewith a link 26, and the said link has its free end pivotally secured to an offset member or finger 27 formed with the brake lever 28. The lever is pivotally secured to a depending plate or bracket upon one of the sides of the body, the said plate projecting above the top 2 of the body and having its upper end arcuate or struck concentrically from the pivot connecting the lever with the plate, and the said plate adjacent the said upper curved edge is provided with a plurality of spaced apertures 29 while the brake lever is provided with a pin 30 which is adapted to be brought to engage with any one of the apertures whereby the desired amount of pressure between the brake shoe and the brake band may be maintained and the speed to which the machine travels regulated. It is, of course, to be understood that when the brake shoe is brought to engage with the brake band at a desired frictional contact the propulsion of the machine will be halted. The means for propelling the machine will hereinafter be more fully set forth.

Arranged centrally and secured to the underface of the body, at the rear portion thereof, is a substantially rectangular body like casing 31, the rear axle 19 passing through suitable openings, but may also provide bearings for the said axle, and the portion of the axle within the said casing has loosely arranged thereon comparatively small gear wheels 32 and 33. Each of the gears 32 and 33 have their inner or confronting sides flanged and the said flanges provided with inwardly extending lugs 34. If desired, the adjacent or confronting faces of the said gear wheels 32 and 33 may be cam-shaped, whereby to engage with the opposite cam-shaped faces of a clutch sleeve 35 which sleeve, however, in the construction illustrated by the drawings, has its opposite faces provided with pins or lugs 36, the clutch sleeve being provided with a feather which is received in a groove in the axle and it will be apparent that when the same is brought to have its clutch face or lug engage with the clutch face or lug of either of the gears 32 or 33, one of the said gears will be revolved to rotate the axle 19 in one of two directions, as will hereinafter be more fully apparent. The clutch sleeve 35 is centrally provided with an annular groove 37 which is engaged by a finger 38 provided upon a member 39 that is secured to a transversely disposed rod 40, the said rod having one of its ends formed with an eye which is engaged by a helical spring 41 that is secured to the body of the device and which, of course, is adapted to draw the rod in one direction whereby to normally retain the clutch in engagement with the gear wheel 32 so that the machine will be normally propelled in a forward direction, as will hereinafter be fully understood. The opposite end of the rod 40 is connected with an arm 42, the said arm being approximately centrally pivotally connected, as at 43, to a depending member or lug 44 secured to the body of the machine, and the free end of the arm is provided with a beveled or cam surface 45 that is slightly out of contact with the cam member 18, and by this arrangement it will be apparent that should the buffer member 15 contact with an obstruction, the rods 13 will be forced rearwardly against the pressure of the springs 16 so that the cam member 18 upon the connecting member 15 of the said rod will engage with the cam end 45 of the arm 42 to swing the arm upon its pivot 43 and consequently move the rod 40 longitudinally through its bearings to cause the finger 38 upon the member 39, secured to the said rod 40, to slide the clutch 35, thus bringing one of its cam faces or lugs 36 to engage with the cam face or lug 34 of the gear 33, causing the rotation of the said gear and the reverse movement of the propelling wheels as will hereinafter be apparent.

The motor employed is in the nature of a flat spring 46 which is wound upon itself around a shaft 47, the said shaft being journaled in suitable bearing openings in the sides of the casing 31. The spring, of course, has one of its ends secured to the shaft and its outer end secured to the casing. The

shaft 47 has loosely arranged thereon a gear spur wheel 48 and has secured thereto a ratchet wheel 49 that is normally engaged by a dog 50 that is pivotally secured to the spur gear 48. Also journaled in suitable bearing openings in the sides of the casing 31 is a second shaft 51 that has keyed or otherwise secured thereto a pinion 52 that meshes with a gear 48. Secured to the said shaft 51 is a gear wheel 53 that meshes with a gear 32 upon the rear axle 19. Also secured upon the shaft 51 is a toothed wheel 54 that meshes with a toothed idler wheel 55 and the wheel 55 meshes with a gear 33 upon the rear axle 19. By this arrangement it will be noted that the gear 33 normally runs loose upon the axle 19 while the gear 32 is normally engaged by the clutch member 19 to propel the machine in a forward direction and it will also be apparent that when the bumper contacts with the obstruction the same moves the rods 13 and the connecting plate 15 for the said rods in a rearward direction, the cam member 18 contacting with the cam surface 45 upon the arm 42 will, as hereinafter described, swing the said arm upon its pivot to draw the clutch member into engagement with the gear 33, and through the medium of the toothed wheel 55 meshing with the said gear 33 the machine will be propelled in a rearward or reverse direction. It will be noted that the movement of the wheel in a rearward or reverse direction will be of a comparatively short duration, and as it is obvious that should the machine be again propelled in a forward direction, the bumper will again be brought into contact with the obstruction, I provide means for automatically turning the front axles to steer the machine away from the obstruction.

Secured to one end of the shaft 51 is a beveled toothed wheel 56 which engages with a similar toothed wheel 57, that is secured to a vertically disposed shaft 58, the said shaft being mounted in suitable bearings and projecting through an opening in the top 2 and having its upper end provided with a toothed wheel 59.

Mounted for rotation upon a vertically disposed stud shaft 60 is a flat wheel 61, the said wheel having a plurality of spaced notches, certain of which being arranged in stepped relation with each other, as indicated by the numerals 62 and 63, whereby the flat wheel 61 is provided with a plurality of spaced cam surfaces. Secured to the underface of the cam wheel 61 and also journaled upon the stub shaft 60 is a toothed wheel 64 that meshes with a toothed wheel 65 which in turn meshes with the toothed wheel 59, and by this arrangement it will be noted that when the motor shaft 47 is revolved to turn the shaft 51, the cam wheel 61, through the intermeshing gear wheels, will be revolved at a comparatively low speed.

The periphery of the cam wheel 61 is engaged by a flanged roller 66 that has its shaft 66' journaled in bearing openings in arms provided in the bifurcated end of a rod 67, the said rod passing through openings in spaced bearing lugs 68, the portion of the rod between the bearings having adjustably secured thereon a collar 69, and this portion of the rod being also surrounded by a helical spring 70 which exerts a pressure between the outer bearing 68 and the collar 69 to project the rollers 65 in the direction of the wheel 61, and against the periphery of the said wheel and be engaged by the cam surfaces on the said wheel. The rod 67 has its forward or outer end provided with a rack bar 71, the teeth of which co-engage with those of the pinion 11 upon the king pin or shaft 10 of the forward axle 5, and by this arrangement it will be noted that the forward or front axle 5 will be turned at spaced but determined intervals so that the machine will be caused to travel an irregular course. The roller when contacting with the cam surface 63 of the wheel 61 will, for instance, cause the machine to be propelled, say, in a right hand direction; when the wheel is brought to contact with the cam surface 62, the axle 5 will be turned directly at a right angle to the body of the device, and so the machine will be propelled in a straight direction, while when the roller is brought to engage with the peripheral surface 72, the axle will be turned to cause the machine to be propelled in, say, a left hand direction, and thus it will be noted that in accordance with the notches or steps in the periphery of the wheel 61, the machine will at all times be propelled in various directions and, as previously stated, when brought to contact with an obstruction will reverse itself and be again propelled in a forward direction away from the obstruction.

As the device is primarily adapted to be constructed in the form and shape of an ordinary automobile, I provide novel means for winding the spring motor 46. Upon the front plate 8 of the body centrally between the spaced sleeves 12 I provide a sleeve 73 which has passed therethrough a shaft 74, the outer end of the said shaft being approximately square in cross section and receiving the squared bore of the tubular member 75 formed with or secured to a crank 76. The inner end of the shaft 74 has arranged thereon a pinion 77 which meshes with a similar pinion 78 that is secured on a shaft 79 carried by the plate 8. The said shaft 79 projects inward of the body of the machine and having a knuckle connection with a rod 80, the opposite or free end of the

said rod 80 having a knuckle or universal joint connection with a shaft 81 that is journaled in a suitable bearing sleeve 82 secured to the body of the machine and that has its end provided with a beveled toothed wheel 83 that meshes with a similar toothed wheel 84 that is secured upon one of the ends of the motor shaft 47 that projects through its bearing opening in one of the sides of the casing 31. By actuating the crank 76 it will be noted that the motor will be wound from the front of the device, and from the foregoing description when taken in connection with the drawings the construction and operation of the improvement will, it is thought, be apparent without further detailed description.

Having thus described the invention, what I claim is:

1. In a mechanical toy, propelling wheels and steering wheels, each journaled upon an axle, a motor for actuating the axle of the propelling wheels, a cam wheel also actuated by the motor, a flanged roller engaging the periphery of the cam wheel, spring means for retaining the roller in such engagement, a rack bar connected with the roller, a king pin for the axle of the steering wheels, and a pinion upon the said pin engaging with the rack bar.

2. In a mechanical toy, propelling wheels and steering wheels, and axles for said wheels, slotted brackets receiving the axle of the steering wheels, a motor for actuating the axle of the propelling wheels, a wheel having stepped peripheral depressions actuated by the motor, a flanged roller engaging the periphery of said wheel to engage with the steps thereof, spring means for retaining the roller in such engagement, a rack bar associated with the roller, a king pin journaled in bearings and secured centrally to the shaft of the steering wheels, and a pinion secured upon said pin and co-engaging with the rack bar.

3. In a mechanical toy, a body, propelling wheels, and steering wheels for the body, a motor for actuating the propelling wheels, a bumper, spring means for normally retaining the bumper at a determined point in advance of the body, and means actuated by the bumper, when the said bumper is moved in the direction of the body, for reversing the direction of travel of the body.

4. In a mechanical toy, a body, propelling wheels and steering wheels for the body, an axle for said propelling wheels and an axle for said steering wheels, a motor, means actuated by said motor for turning the axle of the steering wheels to direct the travel of the toy, spaced gears loose on the axle of the propelling wheels, a clutch keyed upon the shaft between the gears, spring means for normally forcing the clutch to engage with one of the gears, a bumper for the body, and means operative by said bumper, when the same is moved in the direction of the body, for operating the clutch to bring the same into interlocking engagement with the second gear upon the axle of the propelling wheels.

5. In a mechanical toy, a body, propelling wheels and steering wheels upon the body, an axle for the propelling wheels, an axle for the steering wheels, spaced pinions loose on the axle of the propelling means, a motor actuating said pinions, a clutch keyed upon the said axle, spring actuated means for normally forcing the clutch into engagement with one of the referred to pinions, a spring pressed bumper for the body, a cam member associated with the bumper, a pivoted arm having a cam surface disposed to be engaged by the cam member of the bumper, and a connection between the said arm and the sliding means for the clutch, whereby when the bumper is moved inwardly of the body to swing the arm and slide the clutch to bring the same into engagement with the other pinion on the propelling axle.

6. In a mechanical toy, a body, propelling wheels and steering wheels for said body, an axle for the propelling wheels, an axle for the steering wheels, spaced pinions loosely arranged upon the propelling axle, a spring motor for actuating said pinions, a slidable clutch on the propelling axle between the pinions, a rod mounted in bearings adjacent the clutch, spring means for drawing the rod in one direction, a member upon the rod co-engaging with the clutch to normally retain the same in engagement with one of the referred to pinions, an approximately centrally pivoted arm connected with the other end of the rod, said arm having its free end provided with a cam-shaped surface, a spring pressed bumper member at the front of the machine, guide rods for the bumper member, a connecting element for the guide rods, and a cam member upon the connecting member to co-act with the cam shaped end of the pivoted arm, whereby when the bumper is forced in the direction of the body, to swing the said arm to slide the rod to move the clutch into engagement with the free pinion to reverse the direction of travel of the propelling wheels.

7. In a mechanical toy, propelling wheels and steering wheels, an axle for the propelling wheels, an axle for the steering wheels, a pin centrally connected to the axle of the steering wheels, a toothed wheel upon the pin, a spring pressed buffer at the front of the toy, pinions loosely journaled on the axle of the propelling wheels, a sliding clutch keyed upon the said axle disposed between the pinions, spring means for moving the clutch to engage with one of the pinions, a motor actuating the pinions, a cam wheel also actuated by the motor, a spring pressed

rack bar meshing with the referred to toothed wheel upon the pin on the axle of the steering wheels, and contacting with the said cam wheel, a cam member associated with the buffer, a rod having a cam surface co-engaging with the cam on the buffer, and a connection between the said rod and the referred to clutch whereby to actuate the clutch when the cam end of the rod is engaged by the cam member upon the buffer to move the said clutch to engage with the second and free pinion on the drive shaft to reverse the direction of travel of the toy.

In testimony whereof I affix my signature.

JAMES CIAFFONE.