

Aug. 24, 1937.

L. MARX

2,091,004

REVERSING TOY VEHICLE

Filed Sept. 17, 1935

2 Sheets-Sheet 1

Fig. 1.

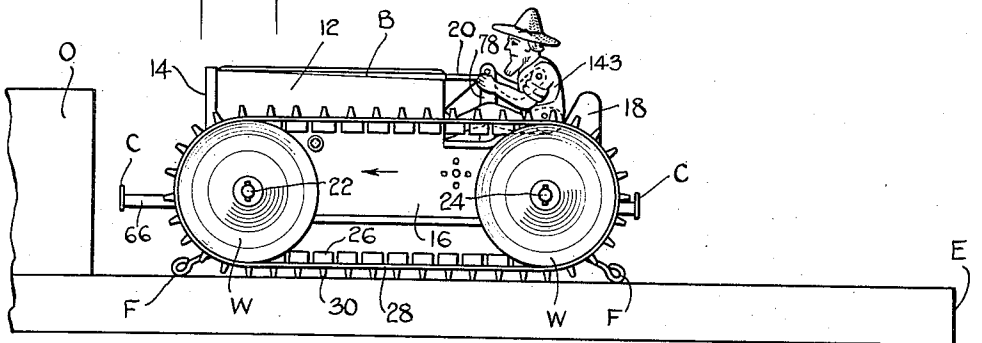


Fig. 2.

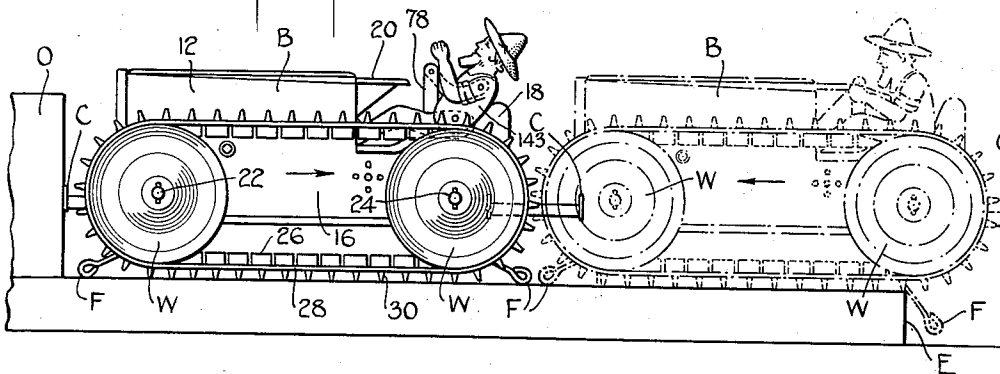


Fig. 6.

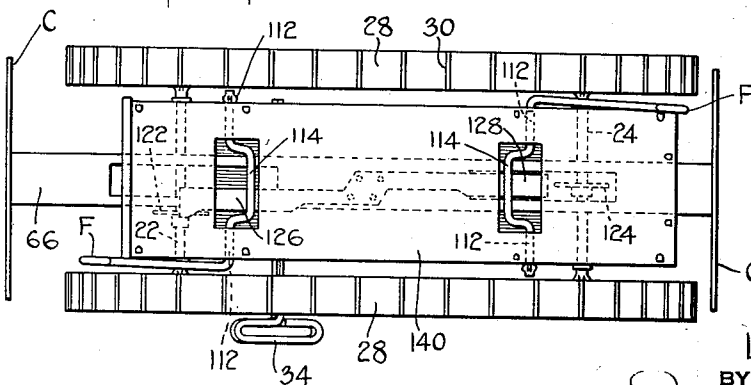
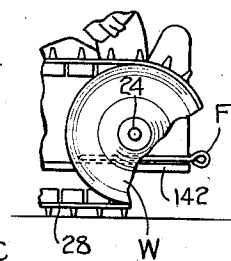


Fig. 7.



INVENTOR
Louis Marx

BY

James * Franklin
ATTORNEYS

Aug. 24, 1937.

L. MARX

2,091,004

REVERSING TOY VEHICLE

Filed Sept. 17, 1935

2 Sheets-Sheet 2

Fig. 3.

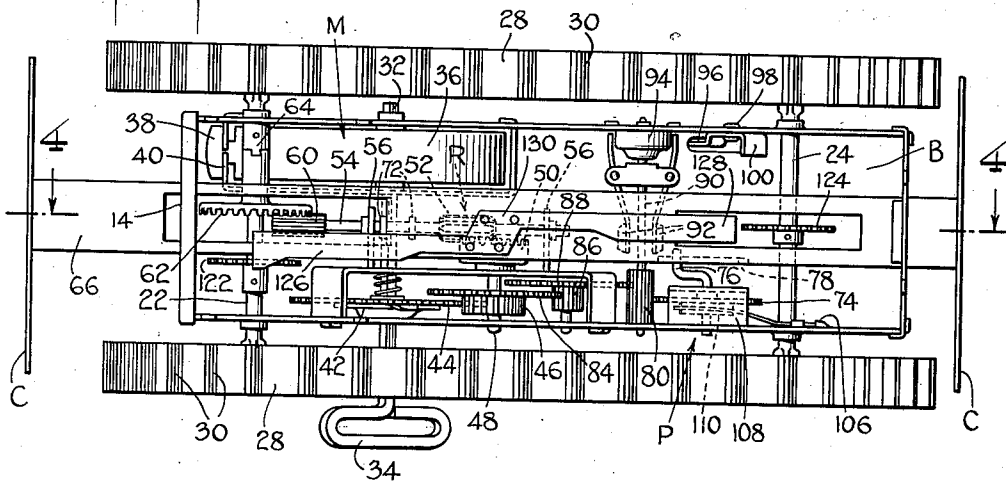


Fig. 4.

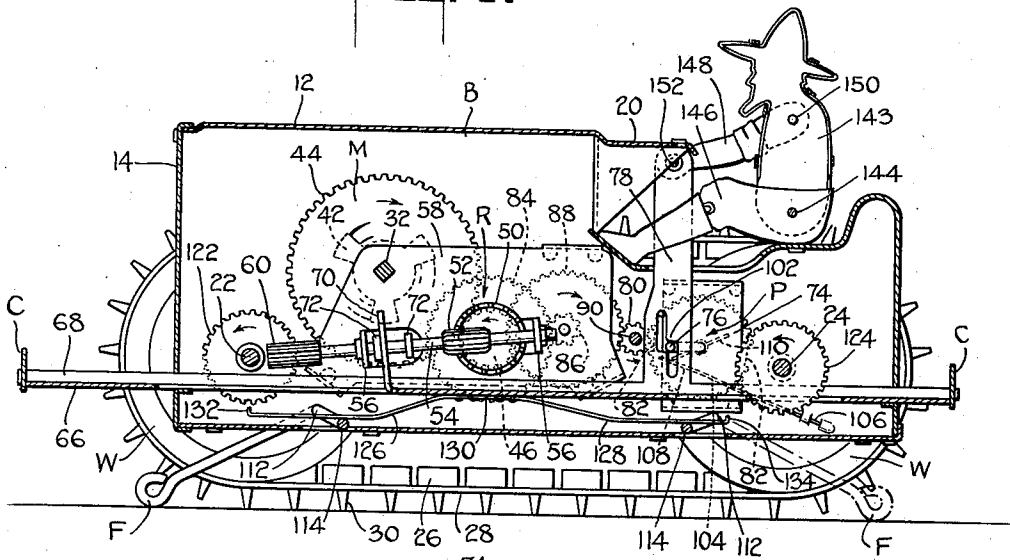
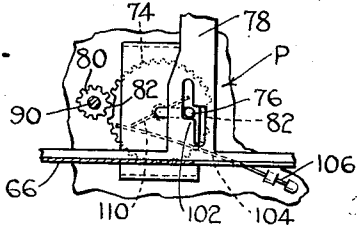


Fig. 5.



INVENTOR
Louis Marx

BY
James & Franklin
ATTORNEYS

UNITED STATES PATENT OFFICE

2,091,004

REVERSING TOY VEHICLE

Louis Marx, New York, N. Y.

Application September 17, 1935, Serial No. 40,894

23 Claims. (Cl. 46—212)

This invention relates to toys, and more particularly to a toy vehicle provided with automatically operable reversing mechanism.

The primary object of my invention resides in the provision of a motor-driven toy vehicle provided with reversing mechanism between the motor and the wheels together with one or more suitable contactors for automatically initiating reversal of the movement of the vehicle. Inasmuch as the drive comes into a neutral or disengaged position between the forward and reverse positions of the gearing it is difficult to obtain a complete reversing operation directly from the contactor, this being especially true when the vehicle is moving slowly, and it is accordingly a further object of my invention to ensure completion of the reversing operation, preferably under power drive from the motor propelling the vehicle.

In accordance with a more particular feature and object of my invention, the contactors may take the form of front and rear bumpers on the vehicle, the front bumper serving to change the drive from forward to reverse when striking an obstacle, and the rear bumper serving to change the drive from reverse to forward when striking an obstacle. In accordance with another feature and object of my invention the contactors may take the form of front and rear feelers adapted to touch the table or like running surface, the vehicle drive being changed from forward to reverse when the front feeler passes over the edge of the running surface, and conversely, from reverse to forward when the rear feeler passes over the edge of the running surface. In preferred form the toy is provided with both the bumpers and feelers, thus making the same exceedingly versatile in operation, for it performs in a safe and amusing manner whether running between obstacles or on a table or raised surface with a free edge, or between an obstacle and a free edge.

The vehicle preferably simulates a farm tractor provided with an endless tread, for it may then run partially over the edge of a table or the like while retaining suitable clearance and traction to run in the opposite direction when the driving gear is reversed. With this arrangement the feelers may be short and located in a nearly concealed position on the vehicle body. In order not to interfere with the climbing properties of the tractor, the bumpers are elevated, and optionally usable means are provided to hold the feelers in elevated inoperative position. The tractor may be provided with a figure simulating

the operator thereof, in which case said figure is preferably pivoted and connected to a reversing lever, so that the operator appears to reverse the tractor.

To the accomplishment of the foregoing and other objects which will hereinafter appear, my invention consists in the reversing vehicle elements and their relation one to the other, as hereinafter are more particularly described in the specification and sought to be defined in the claims. The specification is accompanied by drawings in which:

Fig. 1 is a side elevation of a toy embodying features of my invention;

Fig. 2 is a similar elevation showing the toy in operation;

Fig. 3 is an inverted plan view with the bottom of the vehicle body and feelers removed;

Fig. 4 is a section taken in elevation;

Fig. 5 is a detail explanatory of the power driven mutilated gear reversing mechanism;

Fig. 6 is an inverted plan view of the toy with the bottom and feelers in place; and

Fig. 7 is a detail showing the manner in which the feelers may be fixed in elevated inoperative position.

Referring to the drawings, the vehicle comprises a body B, mounted on wheels W and carrying a driving motor M which is connected to one or more of the wheels through a suitable reversing gear R. The toy is provided with one or more contactors for automatically reversing the direction of the toy, these contactors being here exemplified by front and rear bumpers C, and front and rear feelers F. As will be evident from inspection and comparison of Figs. 1 and 2, the vehicle approaching an obstacle O, as illustrated in Fig. 1, is reversed when a bumper C strikes the obstacle. Furthermore, as the vehicle approaches and begins to pass a table edge or the like as indicated at E, a feeler F detects this danger and reverses the direction of operation. In order to ensure quick, sensitive and complete operation of the reversing gear, the reversing operation is completed under power drive from the motor by means generally designated P (Fig. 4).

Considering the arrangement in greater detail, the vehicle here disclosed simulates a farm tractor and the body B is made up of suitable pieces of sheet metal shaped and bent to form a hood 12, radiator 14, a frame 16, a seat 18 and steering wheel 20. The wheels W are all alike and are mounted on front and rear axles 22 and 24 which pass through the body. The wheel pe-

ripheries are V-shaped in cross-section and receive the V-shaped blocks 26 of the continuous rubber treads 28, the outer surfaces of which are provided with suitable projections 30 to ensure adequate traction even when climbing.

The motor M may be of conventional type and in the present case is a spring motor comprising a square winding stem 32, one end of which is bent to form a winding key 34. A steel ribbon spring 36 is connected at its inner end to the winding stem and at its outer end 38 to a suitable frame 40 secured to the side wall of the body. Winding stem 32 is connected through a suitable ratchet or clutch 42 to a gear 44 meshing with a pinion 46 fixed to a short shaft 48 carrying a crown gear 50 forming a part of the reversing gear. The other part of the reversing gear comprises a mating pinion 52, the ends of which are bevelled to facilitate meshing of the gears during the reversing operation. It will be understood that the length of pinion 52 is less than the diameter of crown gear 50 and that the pinion is axially reciprocable between positions meshing with either side of the crown gear, thereby reversing the direction of rotation of the pinion.

Pinion 52 is fixed to a longitudinally slidable shaft 54 carried in bearings 56 bent outwardly from the wall of a frame 58 which carries the aforesaid step-up gear train. The forward end of shaft 54 is provided with an elongated pinion 60 constantly meshing with one side of a crown gear 62 connected to the axle 22 by a suitable coupling 64. The pinion 60 is sufficient in length to keep it in mesh with crown gear 62 during reciprocation of reversing gear pinion 52.

Front and rear bumpers C are symmetrically arranged and are connected to the forward and rear ends of a longitudinally reciprocable bar 66, the side edges of which may be flanged upwardly as indicated at 68 in order to stiffen and strengthen the same. A part of bar 66 is bent upwardly at 70 and encompasses pinion shaft 54. The latter is provided with collars 72 on either side of the projection 70 so that movement of the bumper bar 66 causes movement of the reversing pinion. In Fig. 4 the gears are shown in position for forward drive and it will be noted that the bumper bar projects forwardly. When the forward bumper strikes an obstacle it moves the bumper bar, tending to shift the reversing gear from the forward to the reverse drive position.

Inasmuch as the vehicle, particularly when traveling slowly, as in the case of a tractor, will not have sufficient inertia to complete the desired reversing operation, and in any case in order to make the operation of the toy entirely fool-proof and dependable, I do not rely upon the physical movement of the bumper to cause reversal of the gearing and in fact, it will be noted that the collars 72 are spaced somewhat so that any slight initial movement of the bumper bar is ineffective to shift the gears. To obtain a positive gear shift under power drive, I employ a mutilated gear 74 connected to a crank arm 76 engaging a slotted member 78 connected to bumper bar 66. Mutilated gear 74 is adapted to mesh with a pinion 80, but is normally disengaged therefrom because of the removal of several teeth at diametrically opposed points 82, as is best shown in Fig. 5.

Pinion 80, it will be observed, forms a part of the governor mechanism and is constantly rotated, the governor being driven by suitable step-up gearing including a gear 84 fixed to pin-

ion 46 and meshing with a pinion 86 itself fixed to a gear 88 which in turn meshes with governor pinion 80. The latter rotates a governor shaft 90 carrying weight arms 92, the opposite ends of which bear frictionally against a drum 94 fixed to the side of the body. A suitable stopping and starting lever 96 is pivoted at 98 and includes a depending portion 100 adapted to be moved into the path of the rotating governor arms, thereby stopping the motor.

The upward projection or arm 78 on bumper bar 66 is preferably formed to simulate a reversing lever, although it is fixedly mounted on the bumper bar. The arm 78 is vertically slotted to receive the crank 76, but the upper and lower portions of the slot are relatively offset, thus forming shoulders 102 which function to arrest further movement of the crank after each reversing operation. The crank and mutilated gear 74 are so related that when the crank is in its position of rest or mid-position, the gear is out of mesh with pinion 80. As viewed in Fig. 4, the vehicle is traveling ahead and crank 76 is in its forward position, further movement thereof being stopped by the upper shoulder 102. When the front bumper strikes an obstacle and is moved even slightly, the reversing arm 78 is moved slightly toward the rear, thereby moving the top shoulder 102 away from crank pin 76 and clearing the same for movement in the upper slot.

To ensure prompt meshing of the mutilated gear with pinion 80, I provide a light cantilever spring wire or starter spring 104, fixed to the vehicle body at 106 and having its free end 108 bearing upwardly against the downwardly disposed half of a diametrical arm 110, the latter being fixed to the shaft of the mutilated gear.

When the mutilated gear comes into mesh it is positively driven under power and moves reversing arm 78 rearwardly, thereby shifting the pinion 52 of the reversing gear from the forward to the rear edge of crown gear 50. After completing a half revolution, the crank pin 76 reaches and bears against the lower shoulder 102, as is shown in Fig. 5, thereby preventing further movement. At the same time the gear 74 is disengaged from pinion 80, by reason of the missing teeth at section 82. The parts are now in position for again reversing the direction of travel from rearward to forward, for upon contact of the rear bumper with an obstruction, the bumper bar 66 is shifted forward slightly, thereby removing the bottom shoulder 102 from beneath reversing crank 76, whereupon the mutilated gear is again moved into mesh by the starter spring 104 and is again positively rotated for half a revolution, thus shifting the reversing gear to the forward driving position.

As was heretofore mentioned, the direction of the toy may also be reversed by the feelers F. These are formed of bent wire looped at the lower ends to move along the running surface with a minimum of friction. They are pivotally mounted on the body at 112 and are centrally offset at 114 as is best shown in Fig. 6. While these feelers might be connected to the reverse gear or to the bumper bar in order to provide the slight initial movement needed to start the power drive of the reversing lever, I prefer to make the arrangement even more sensitive so that the feelers, while light in weight, will, when descending, initiate a preliminary power movement of the bumper bar, which in turn is followed by the power driven reversing operation heretofore described. To attain this sensitive response I pro-

vide the front and rear axles 22 and 24 with trip gears 122 and 124, and I provide the bumper bar 66 with trip members 126 and 128 located adjacent the trip gears 122 and 124. Specifically, the trip members are here exemplified by an elongated leaf spring, the central portion 130 of which is secured to the bumper bar and the end portions of which are bent downwardly to normally underlie the trip gears. The tips of trip springs 126 and 128 are bent upwardly at 132 and 134 to engage the teeth of trip gears 122 and 124, respectively, when the springs are elevated.

It will be observed from inspection of Fig. 4 that in the forward driving position, the tip 132 of trip spring 126 underlies trip gear 122 and that the offset portion 114 of the forward feeler is disposed directly beneath trip spring 126. When the tractor reaches and runs over a table edge, the forward feeler descends, thereby slightly elevating trip spring 126. This spring is long and thin and offers only negligible resistance to upward movement. The tip 132 of the trip spring thereupon engages the teeth of trip gear 122, which moves the spring rearwardly, thereby moving the bumper bar rearwardly and initiating the power driven reversing operation. At the completion of the reversing operation the tip 134 of the trip spring 128 underlies the rear trip gear 124, this being preparatory to changing the direction from rearward to forward should the rear feeler pass over the edge of the running surface.

Inasmuch as one important feature of the tractor toy is its ability to climb over obstructions, the bumpers and bumper bar are preferably elevated a substantial amount, say approximately at the axle line, so that any obstruction encountered which is lower than the bumper, is climbed by the tractor. If the toy is to be run on the floor or is to be used for climbing purposes, the feelers F are unnecessary and may even prove bothersome. I have accordingly arranged the same so that they may be fixed in elevated position, at which time they are entirely out of the way. For this purpose, the feelers are bent inwardly when viewed in plan (see Fig. 6), so that when elevated they bear against the sides of the vehicle body. The bottom wall 140 of the toy is flanged upwardly at its outer periphery 142 and the feeler may be pushed upwardly until it passes the flange 142 as is clearly shown in Fig. 7. The feeler is then held fixedly in elevated position and is of course not only inoperative, but is preferably located within the periphery of the tractor tread, so that it does not in any way interfere with the climbing ability of the tractor.

Reversing arm 78 preferably projects upwardly to a position at one side of the simulated steering wheel 20 and ahead of the simulated operator. The latter may be formed of sheet metal and the body portion 143 is preferably pivoted at 144 with relation to the leg portions 146. One arm 148 is pivoted to the body at the shoulder 150 and is pivoted to reversing lever 78 at the hand 152. The parts are preferably so dimensioned that the figure sits in a generally erect or forward-leaning position when the toy is running ahead, but is drawn sharply rearwardly, as is best shown in Fig. 2, when the toy is reversed. This produces a comical effect because when the toy strikes an obstruction or reaches a table edge, the operator appears to

draw frantically back in an effort to reverse the tractor in time.

It is believed that the construction and operation as well as the many advantages of my improved reversing vehicle toy will be manifest from the foregoing detailed description thereof. The vehicle may be provided with any desired form of contactor, and the particular forms here described, namely bumpers and feelers, may of course be used alone as well as in combination. The reversing operation is made positive and dependable because it is produced under drive of the motor and the contactors function merely to initiate the reversing operation. Furthermore, in the case of the feelers, the operation is made even more sensitive by using a power impulse for even the preliminary or initial movement of the reversing gear. It will be understood that the toy may be operated back and forth between obstacles, or back and forth between the opposite edges of a running surface, as well as between the obstacle and an edge, the latter condition being illustrated in Fig. 2 of the drawings. Furthermore, the feelers may be elevated out of the way and the tractor used for climbing over obstacles in conventional fashion. The movement of the figure simulatedly driving the toy enhances the realism and amusement value of the toy.

It will be apparent that while I have shown and described my invention in a preferred form, many changes and modifications may be made in the structure disclosed without departing from the spirit of the invention defined in the following claims.

I claim:—

1. A reversing toy vehicle comprising a body, a motor therein, driving wheels thereon, a reversing gear between said motor and wheels, means arranged to be driven by said motor to reverse said reversing gear, a contact bumper, and means so connecting said bumper to said means that said means is made operative and the drive is reversed when the bumper strikes an obstacle.

2. A reversing toy vehicle comprising a body, a spring motor therein, driving wheels thereon, a reversing gear between said spring motor and wheels, means arranged to be driven by said motor to reverse said reversing gear, front and rear bumpers, and means so connecting said bumpers to said means that said means is made operative and the drive is changed from forward to reverse when the front bumper strikes an obstacle, and from reverse to forward when the rear bumper strikes an obstacle.

3. A reversing toy vehicle comprising a body, a motor therein, driving wheels mounted thereon, a gear train interconnecting said motor and driving wheels, said gear train including a reversing gear, a bumper, a reversing arm arranged to be connected to and driven by said motor for reversing said reversing gear, and means whereby the bumper when moved slightly toward the vehicle connects said reversing arm to said motor, so that the reversing operation is completed under power of the driving motor.

4. A reversing toy vehicle comprising a body, a motor therein, driving wheels mounted thereon, a gear train interconnecting said motor and driving wheels, said gear train including a reversing gear, front and rear bumpers connected to one another and to said reversing gear, a mutilated gear connected to said motor for rotating a reversing crank, a reversing arm operated by said crank and connected to said bumpers and revers-

ing gear, and means whereby movement of the bumpers brings said mutilated gear into mesh, so that the reversing operation is completed under power of the driving motor.

5 5. A reversing toy vehicle comprising a body, a motor therein, driving wheels mounted thereon, a gear train interconnecting said motor and driving wheels, said gear train including a reversing gear, an initial control element, a mutilated
10 gear connected to said motor for rotating a reversing crank, a reversing arm connected to said element, a slot therein having relatively offset upper and lower portions receiving said crank, the shoulders between the offset slots serving
15 to arrest movement of the reversing crank until said arm is moved slightly by said element, and a starter spring urging said mutilated gear into mesh, whereby the reversing operation is completed under power when initiated by the
20 element.

6. A reversing toy vehicle comprising a body, a spring motor therein, driving wheels mounted thereon, a gear train interconnecting said spring motor and driving wheels, said gear train including a reversing gear, front and rear bumpers
25 connected to one another and to said reversing gear, a mutilated gear connected to said motor for rotating a reversing crank, a reversing arm connected to said bumpers and reversing gear, a slot therein having relatively offset upper
30 and lower portions receiving said crank, the shoulders between the offset slots serving to arrest movement of the reversing crank until one of the bumpers is moved slightly toward the vehicle body, and a starter spring urging said
35 mutilated gear into mesh, whereby the reversing operation is completed under power of the driving spring when initiated by movement of the bumper.

40 7. A reversing toy vehicle comprising a body, a motor therein, driving wheels mounted thereon, a reversing gear between said driving motor and said wheels, a feeler mounted on said body and adapted to touch the table or like running
45 surface at one end of the vehicle, and means so interconnecting said feeler and reversing gear that the drive is reversed when the feeler passes over the edge of the running surface.

8. A reversing toy vehicle comprising a body, a motor therein, driving wheels mounted thereon, a reversing gear between said driving motor and said wheels, front and rear feelers mounted
50 on said body and adapted to touch the table or like running surface at the front and rear ends of the vehicle, and means so interconnecting said feelers and reversing gear that the drive is changed from forward to reverse when the front
55 feeler passes over the edge of the running surface, and conversely, the drive is changed from reverse to forward when the rear feeler passes over the edge of the running surface.

9. A reversing toy vehicle comprising a body, a spring motor therein, driving wheels mounted thereon, a reversing gear between said driving motor and said wheels, front and rear feelers
65 pivotally mounted on said body and adapted to touch the table or like running surface at the front and rear ends of the vehicle, and means so interconnecting said feelers and reversing gear that the drive is changed from forward to
70 reverse when the front feeler passes over the edge of the running surface, and conversely, the drive is changed from reverse to forward when the rear feeler passes over the edge of the running
75 surface, and optionally usable means to hold said feelers fixed in elevated inoperative position.

surface, and optionally usable means to hold said feelers fixed in elevated inoperative position.

10. A reversing toy vehicle comprising a body, a motor therein, front and rear axles with driving wheels, a reversing gear connected between
5 said motor and driving wheels, front and rear trip gears on said front and rear axles, trip elements connected to said reversing gear and mounted adjacent said gears, front and rear contact members mounted at the forward and rear
10 ends of the body, and means so connecting said members with said elements that movement of a member moves an element into engagement with a trip gear and thereby moves the reversing gear toward reversing position.

11. A reversing toy vehicle comprising a body, a motor therein, front and rear axles with driving wheels, a reversing gear connected between
15 said motor and driving wheels, front and rear trip gears on said front and rear axles, a trip spring connected to said reversing gear and mounted with its ends beneath said gears, front and rear contact members mounted at the forward and rear ends of the body, and means so
20 connecting said members with said trip spring that movement of a member raises the adjacent end of the trip spring into engagement with the trip gear and thereby moves the reversing gear toward reversing position.

12. A reversing toy vehicle comprising a body, a spring motor therein, front and rear axles with driving wheels, a reversing gear connected between
25 said spring motor and driving wheels, front and rear trip gears on said front and rear axles, a trip spring connected to said reversing gear and mounted with its ends beneath said gears, front and rear feelers pivotally mounted at the forward and rear ends of the body and adapted
30 to run along the table or like surface on which the toy is operated, and means so connecting said feelers with said trip spring that descent of a feeler, as when passing over a table edge, raises one end of the trip spring into engagement with the adjacent trip gear and thereby moves the
35 reversing gear toward reversing position.

13. A reversing toy vehicle comprising a body, a motor therein, front and rear axles with driving wheels, a reversing gear connected between
40 said motor and driving wheels, front and rear trip gears on said front and rear axles, trip elements mounted adjacent said trip gears, front and rear contactors mounted at the forward and rear ends of the body, and means so connecting said contactors with said trip elements that the
45 contactor moves an element into engagement with a trip gear, a reversing arm adapted to be connected to said driving motor, and means whereby movement of an element engaging a trip gear connects said reversing arm to said motor.

14. A reversing toy vehicle comprising a body, a motor therein, front and rear axles with driving wheels, a reversing gear connected between
50 said motor and driving wheels, front and rear trip gears on said front and rear axles, trip elements mounted adjacent said trip gears, front and rear feelers mounted at the forward and rear ends of the body and adapted to run along the table or like surface on which the toy is operated, and means so connecting said feelers with
55 said trip elements that descent of the feeler, as when passing over a table edge, moves an element into engagement with a trip gear, a reversing arm adapted to be connected to said driving motor, and means whereby movement of an element
60 engaging a trip gear connects said reversing arm
65
70
75

to said motor, so that the reversing operation is completed under power from the motor.

15. A reversing toy vehicle comprising a body, a spring motor therein, front and rear axles with driving wheels, a reversing gear connected between said spring motor and driving wheels, front and rear trip gears on said front and rear axles, a trip spring connected to said reversing gear and mounted with its ends beneath said gears, front and rear feelers pivotally mounted at the forward and rear ends of the body and adapted to run along the table or like surface on which the toy is operated, and means so connecting said feelers with said trip spring that descent of the feeler, as when passing over a table edge, raises the adjacent end of the trip spring into engagement with the trip gear and thereby moves the reversing gear toward reversing position, a mutilated gear connected to the said spring motor, a reversing crank, a reversing arm connected to said trip spring and having a vertical slot with offset lower and upper portions receiving said crank, the shoulders of said offset slot serving to arrest movement of the crank until moved by the trip spring, and a starter spring urging said mutilated gear into mesh, whereby the reversing operation is completed under power from the drive spring when initiated by the trip gear.

16. A reversing toy vehicle comprising a body, a motor therein, driving wheels thereon geared to said motor, a reversing gear between said motor and wheels, a bumper, and means so connecting said bumper to said reversing gear that the drive is reversed when the bumper strikes an obstacle, a feeler mounted on said body and adapted to touch the table or like running surface, and means so interconnecting said feeler and reversing gear that the drive is reversed when the feeler passes over the edge of the running surface.

17. A reversing toy vehicle comprising a body, a motor therein, driving wheels thereon geared to said motor, a reversing gear between said motor and wheels, front and rear bumpers, and means so connecting said bumpers to said reversing gear that the drive is changed from forward to reverse when the front bumper strikes an obstacle, and from reverse to forward when the rear bumper strikes an obstacle, front and rear feelers mounted on said body adapted to touch the table or like running surface at the front and rear ends of the vehicle, and means so interconnecting said feelers and reversing gear that the drive is changed from forward to reverse when the front feeler passes over the edge of the running surface, and conversely, the drive is changed from reverse to forward when the rear feeler passes over the edge of the running surface.

18. A reversing toy vehicle comprising a body, a spring motor therein, driving wheels thereon geared to said spring motor, a reversing gear between said spring motor and wheels, front and rear bumpers, and means so connecting said bumpers to said reversing gear that the drive is changed from forward to reverse when the front bumper strikes an obstacle, and from reverse to forward when the rear bumper strikes an obstacle, front and rear feelers pivotally mounted on said body adapted to touch the table or like running surface at the front and rear ends of the vehicle, means so interconnecting said feelers and reversing gear that the drive is changed from forward to reverse when the front feeler passes over the edge of the running surface, and conversely, the drive is changed from reverse to

forward when the rear feeler passes over the edge of the running surface, and optionally usable means to hold the feelers in elevated inoperative position.

19. A reversing toy vehicle comprising a body, a motor therein, front and rear axles with driving wheels thereon geared to said motor, a reversing gear between said motor and wheels, front and rear bumpers, and means so connecting said bumpers to said reversing gear that the drive is changed from forward to reverse when the front bumper strikes an obstacle, and from reverse to forward when the rear bumper strikes an obstacle, front and rear trip gears on said front and rear axles, trip elements connected to said reversing gear and mounted adjacent said trip gears, front and rear feelers mounted at the forward and rear ends of the body and adapted to run along the table or like surface on which the toy is operated, and means so connecting said feelers with said trip elements that descent of the feeler, as when passing over a table edge, moves an element into engagement with a trip gear and thereby moves the reversing gear toward reversing position.

20. A reversing toy vehicle comprising a body, a spring motor therein, front and rear axles with driving wheels thereon geared to said spring motor, a reversing gear between said spring motor and wheels, front and rear bumpers, and means so connecting said bumpers to said reversing gear that the drive is changed from forward to reverse when the front bumper strikes an obstacle, and from reverse to forward when the rear bumper strikes an obstacle, front and rear trip gears on said front and rear axles, a trip spring connected to said reversing gear and mounted with its ends beneath said gears, front and rear feelers pivotally mounted at the forward and rear ends of the body and adapted to run along the table or like surface on which the toy is operated, and means so connecting said feelers with said trip spring that descent of the feeler, as when passing over a table edge, raises the adjacent end of the trip spring into engagement with the trip gear and thereby moves the reversing gear toward reversing position.

21. A reversing toy vehicle comprising a body, a motor therein, driving wheels mounted thereon, a gear train interconnecting said motor and driving wheels, said gear train including a reversing gear, front and rear bumpers connected to said reversing gear, a reversing arm adapted to be operated by said motor, and means responsive to movement of a bumper for connecting said arm to said motor, front and rear feelers mounted on said body and adapted to run along the table or like surface on which the toy is running, and means responsive to movement of a feeler over the edge of the running surface to connect said arm to said motor, so that the reversing operation is completed under power of the motor.

22. A reversing toy vehicle comprising a body, a motor therein, driving wheels and axles mounted thereon, a gear train interconnecting said motor and driving wheels, said gear train including a reversing gear, front and rear bumpers connected to said reversing gear, a mutilated gear connected to said motor for rotating a reversing crank, a reversing arm connected to said crank, whereby the reversing operation is completed under power of the driving spring when initiated by movement of the bumper, front and rear feelers mounted on said body and adapted to run

along the table or like surface on which the toy is running, trip gears on the axles of the toy, trip elements connected to said bumpers and reverse gear and mounted adjacent said trip gears, 5 and means so connecting said feelers to said elements that when a feeler passes over the edge of the running surface, it moves an element into engagement with a trip gear, thereby starting movement of the reverse gear, said movement 10 when initiated being completed by the aforesaid mutilated gear.

23. A reversing toy vehicle comprising a body, a spring motor therein, driving wheels and axles mounted thereon, a gear train interconnecting 15 said spring motor and driving wheels, said gear train including a reversing gear, front and rear bumpers connected to one another and to said reversing gear, a mutilated gear connected to said motor for rotating a reversing crank, a reversing arm connected to said bumpers, a slot 20 therein having relatively offset upper and lower

portions receiving said crank, the shoulders between the offset slots serving to arrest movement of the reversing crank until one of the bumpers is moved slightly toward the vehicle body, and a starter spring urging said mutilated gear into 5 mesh, whereby the reversing operation is completed under power of the driving spring when initiated by movement of the bumper, front and rear feelers pivotally mounted on said body and adapted to run along the table or like surface 10 on which the toy is running, trip gears on the axles of the toy, a trip spring connected to said bumpers and reverse gear with its ends underlying said trip gears, and means so connecting 15 said feelers to said trip spring that when the feeler passes over the edge of the running surface, it elevates the trip spring into engagement with the trip gear, thereby starting movement of the reverse gear, said movement when initiated being completed by the aforesaid mutilated gear. 20

LOUIS MARX.