

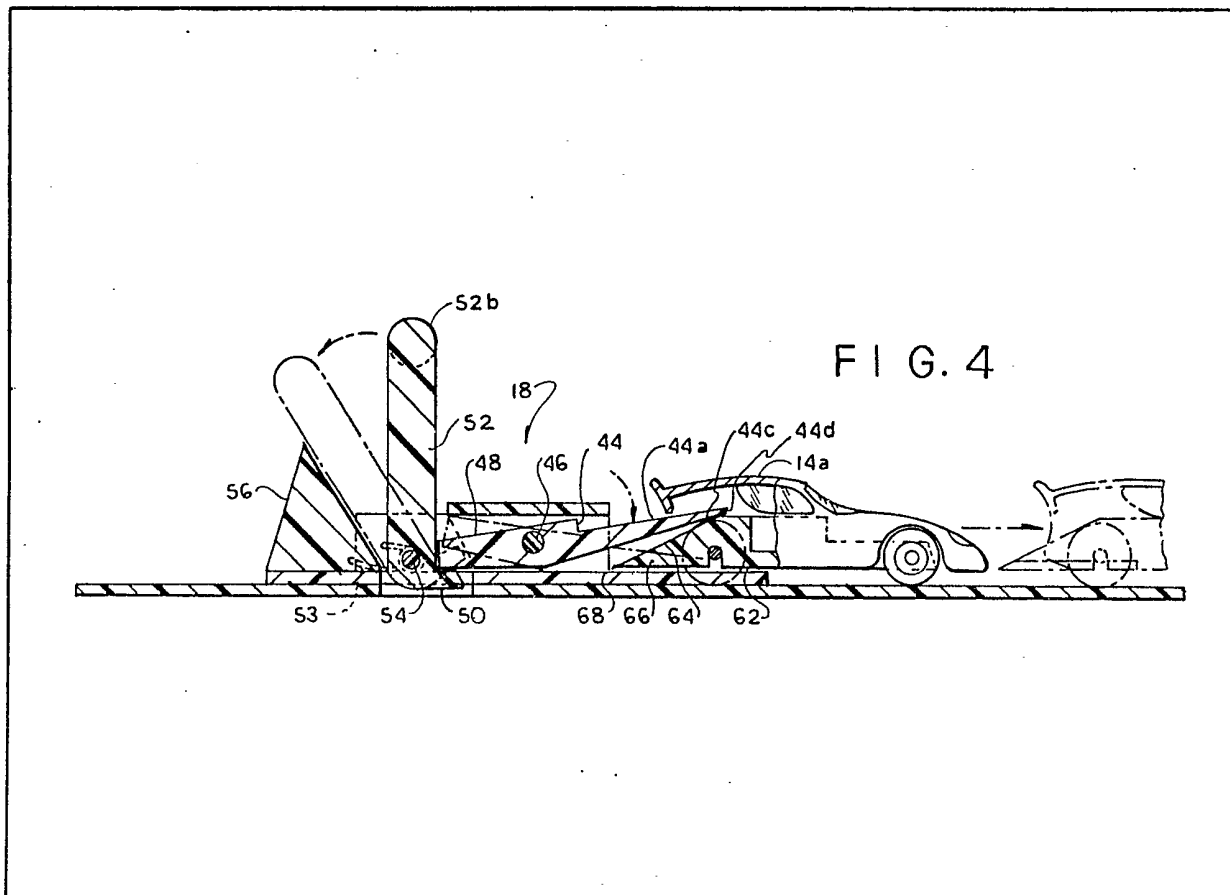
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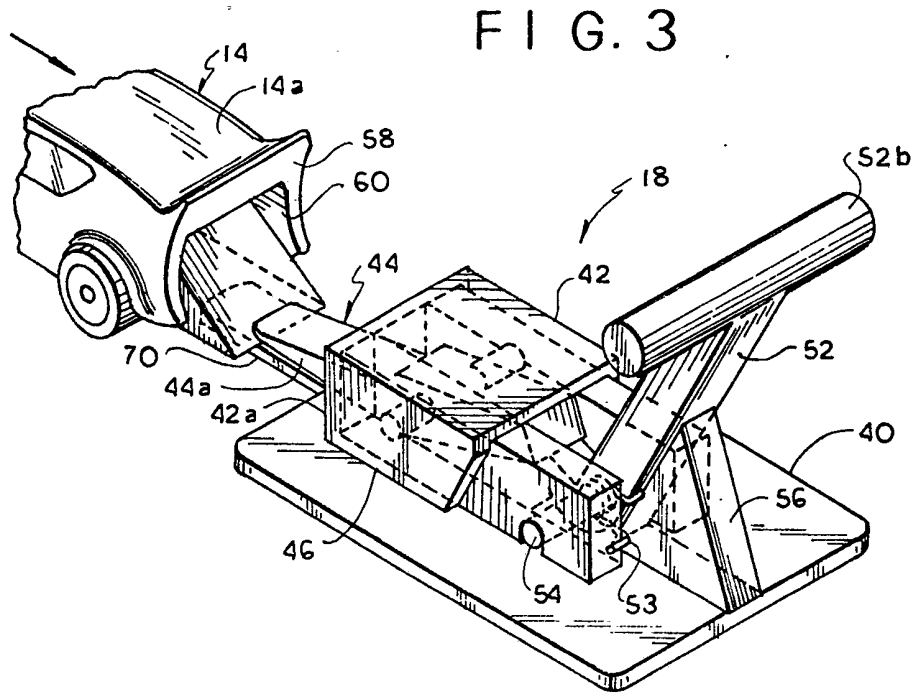
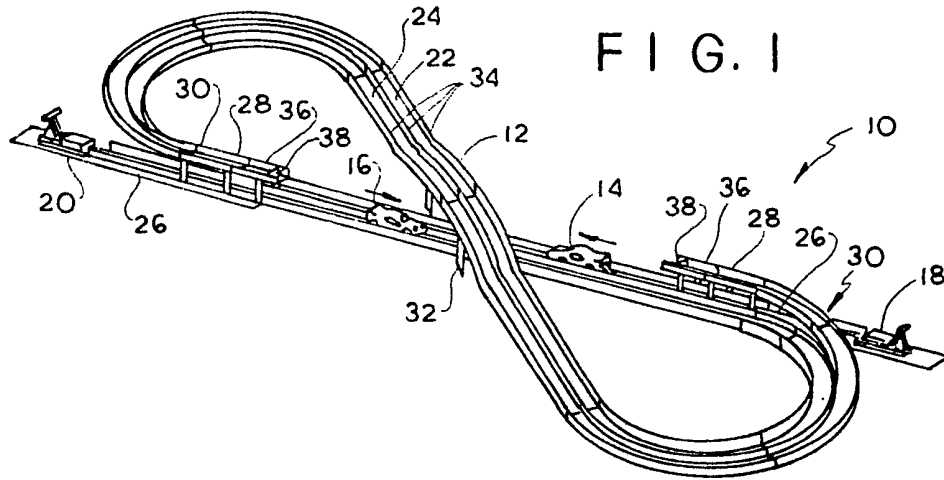
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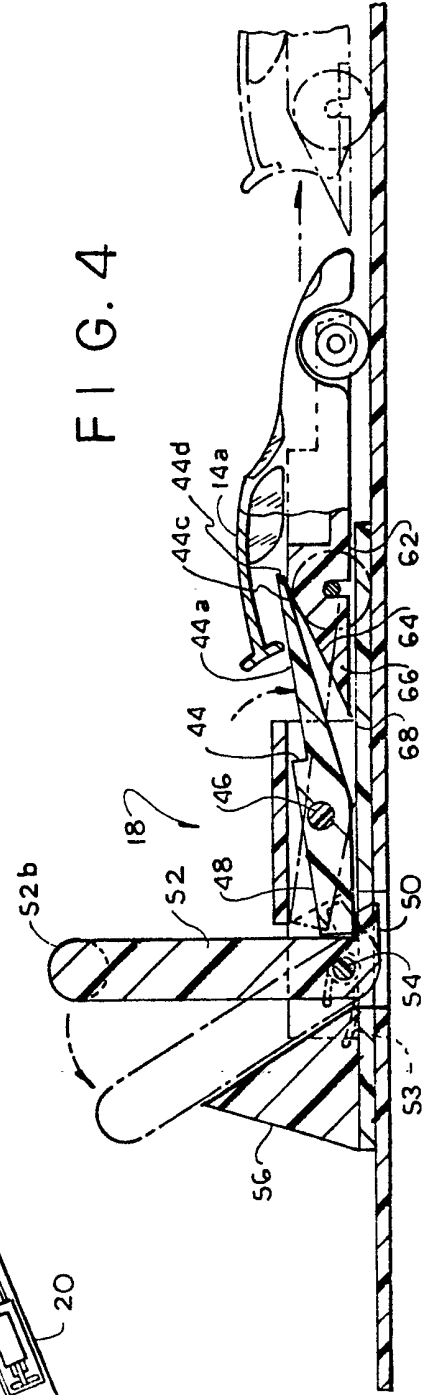
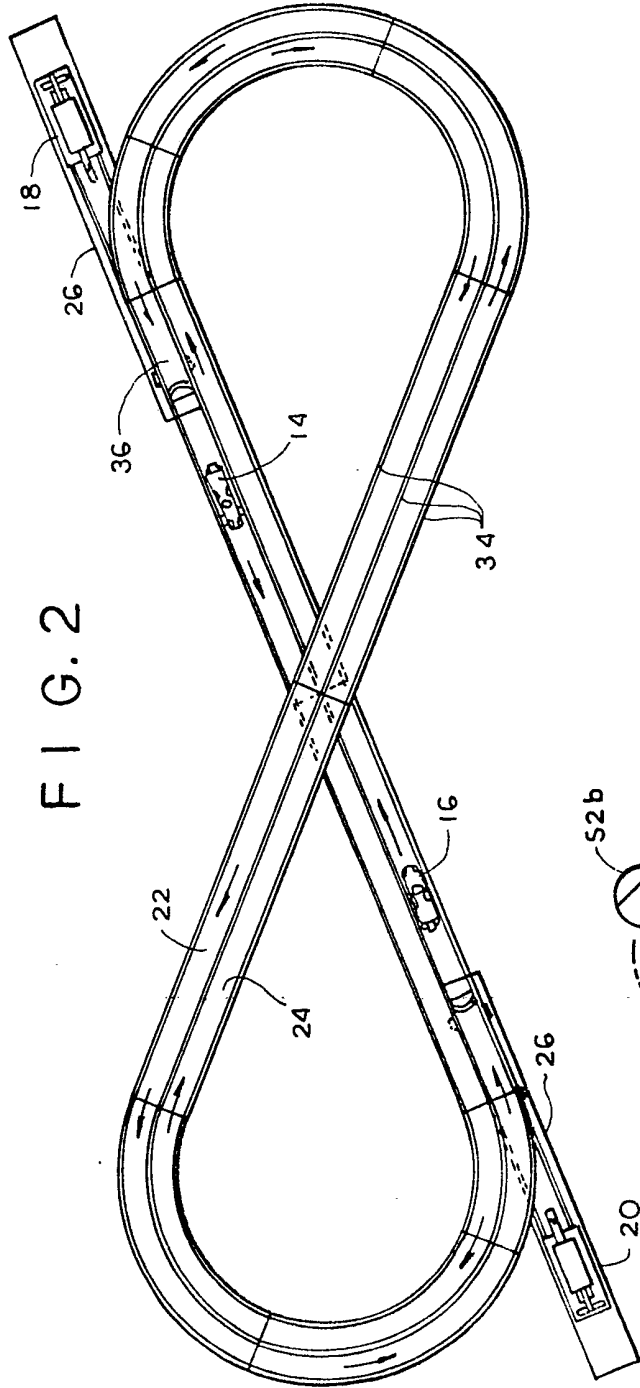
(54) **A toy vehicle and launching device therefor**

(57) The invention relates to a combination comprising a toy vehicle and launching device therefor, wherein the toy vehicle includes a body having an opened rear end and a drive wedge 62 mounted within the body with its apex positioned adjacent the opened end; and the launching device includes means 44 for entering the rear end of the vehicle and applying a squeezing force to the wedge to drive the vehicle in a forward direction.



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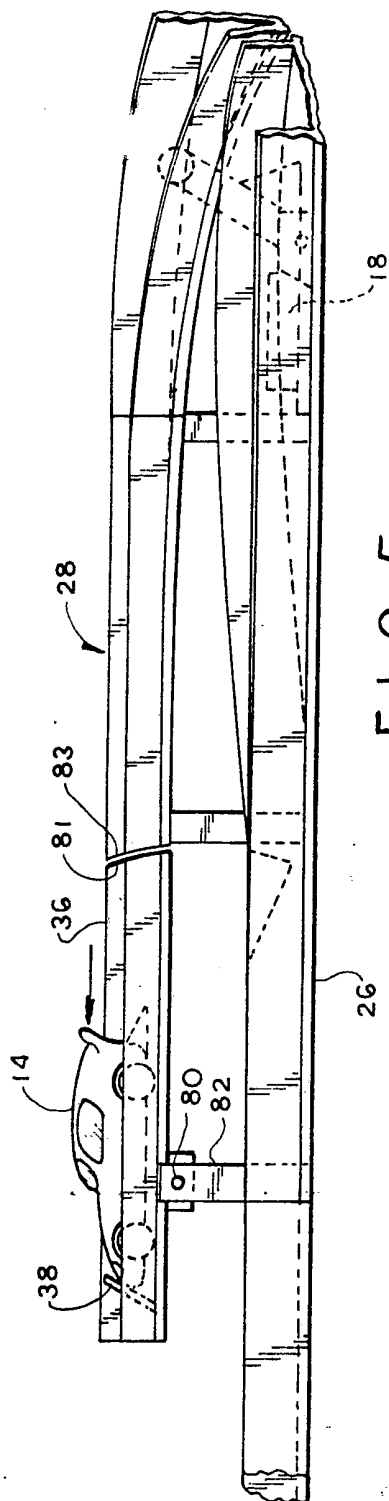


FIG. 5

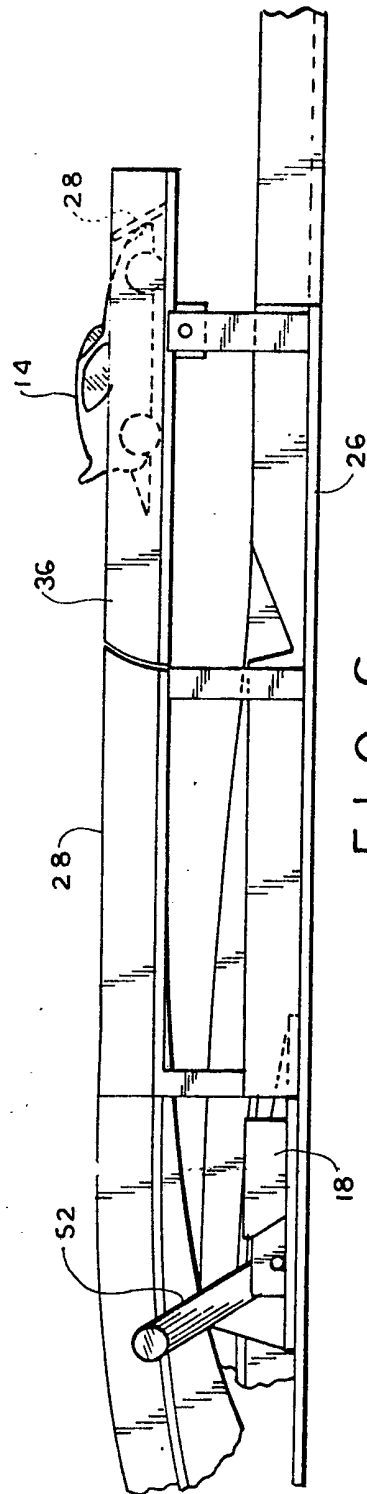


FIG. 6

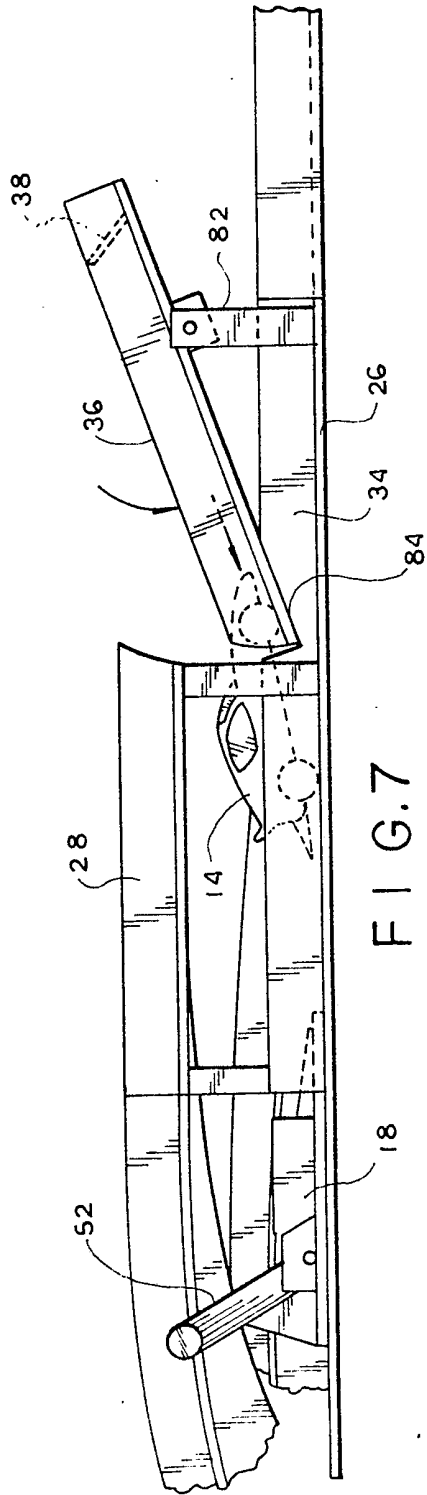


FIG. 7

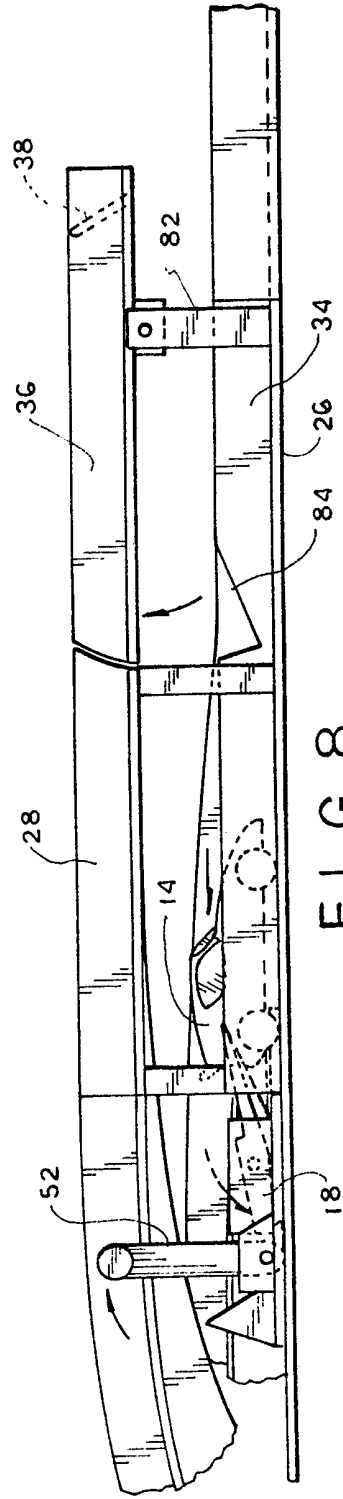


FIG. 8

## SPECIFICATION

**A toy vehicle and launching device therefor**

The present invention relates to a toy vehicle and launching device therefor for use in a game wherein the toy vehicles are repeatedly launched onto the track after each traverse of the track.

The present application is divided out of Application 8232146 which has claims directed to an apparatus for playing a game including a track of novel construction.

Toy vehicle launching devices which apply a squeezing force to a toy vehicle have been disclosed in the past, such as, for example, in U.S. Patent No. 3,952,442; but these launching devices have not been used in toy vehicle race games which are constructed to automatically return the vehicle to the launching device. In addition, the construction shown in the above mentioned patent requires that the toy vehicle has an unrealistic shape, since the body of the vehicle itself forms a surface upon which the squeezing force is applied. The construction of the present invention enables a toy vehicle to have a more realistic appearance. Also automatic reengagement of the vehicle with the launching device is possible without manual positioning of the vehicle by the players.

According to the present invention there is provided a combination comprising a toy vehicle and a launching device therefor, wherein the toy vehicle includes a body having an opened rear end and a drive wedge mounted within the body with its apex positioned adjacent the opened end; and the launching device includes means for entering the rear end of the vehicle and applying a squeezing force to the wedge to drive the vehicle in a forward direction.

The launching devices are constructed to cooperate with the toy vehicle to apply a squeezing force on wedge elements in the toy vehicles which will propel the vehicle in a forward direction about the track with which they may be used so that the vehicle will pass from the start position along the track back to the end position where it again returns to the launching device.

The invention will be described further, by way of example, with reference to the accompanying drawings, in which:—

Fig. 1 is a perspective view of a track with toy vehicles and launching devices therefor;

Fig. 2 is a plan view on an enlarged scale of the apparatus shown in Fig. 1;

Fig. 3 is an enlarged perspective view of the toy vehicle launching device used in the apparatus of Fig. 1 and constructed in accordance with the embodiment of the present invention;

Fig. 4 is a partial longitudinal sectional view of the launching device and toy vehicle showing the launching operation;

Fig. 5 is a side view of the superimposed end and start positions of one of the lanes of the track with the toy vehicle from one side thereof;

Fig. 6 is a side view similar to Fig. 5, but from the other side of the lane;

Fig. 7 is a side view similar to Fig. 6 showing the toy vehicle being returned to the launching device by the pivoted end track section; and

Fig. 8 is a side view similar to Fig. 7 showing the toy vehicle reengaged with the launching device in preparation for relaunch.

Referring now to the drawings in detail, and initially to Fig. 1 thereof, a toy vehicle game apparatus 10 includes a track 12, a pair of vehicles 14, 16, and a pair of projecting or launching devices 18, 20 respectively associated with each of the toy vehicles. The launching devices are of identical construction as described hereinafter.

Track 12 consists of a plurality of track sections interconnected in any convenient known manner. In the illustrative embodiment of the invention, the track is laid out in a figure-8 shape, however, other shapes such as ovals or multiple loops can be utilized instead. Regardless of the track arrangement, the track is constructed to provide a pair of separate and independent lanes 22, 24 in which the toy vehicles 14, 16, respectively and independently operate. Each lane has a start position 26, and an end position 28 located immediately above the start position. The end position of each lane is defined by a ramp section 30 which guides the toy vehicle to a position superimposed above the start position. In the illustrative embodiment, a central bridge arrangement 32 is provided to permit the track lanes to cross one another. By this construction, the track lanes have exactly the same length so that a toy vehicle race can be simulated. In the case, toy vehicles 14, 16 are launched by their respective launching devices 18, 20 and propelled along their associated track lanes. The vehicles move along their lanes and are guided to the end sections 28 by sidewalls 34 formed along the track sections. At each end track section, a pivoted section 36 is provided which has an end abutment 38 that stops movement of the toy vehicle in the forward direction. This pivoted track section is normally in the horizontal position so that it can receive the toy vehicle from the ramp section of the track. When the vehicle enters the pivoted section 36, the weight of the vehicle causes the section to pivot downwardly so that the vehicle rolls under the force of gravity in the reverse direction down the pivoted track section and into its associated launching devices which can then be operated to propel the toy vehicle again along the track. If desired, the launching devices and/or the end track sections may include an automatic counter of any convenient construction (not shown) so that the players can keep count of the number of laps traversed by their toy vehicle. The first player to accumulate the preselected number of laps wins the race.

The toy vehicle and launching devices construction is shown more clearly in Figs. 3 and 4. Since each of the launching devices are identical in construction, only launching device 18 is illustrated and described in detail. As seen therein, the launching device includes a base plate

40 on which a housing 42 is secured. A first lever 44 is pivoted by a pair of pins 46 in housing 42. This lever has a first end portion 44a which is generally wedge shaped. The opposite end 48 of lever 44 is generally square in cross-section and engages the hook end 50 of a handle 52. The latter is pivotally mounted by a pin 54 in housing 42 with its pivotal movement being limited in the clockwise direction by an abutment 56 formed on base 40. End 52b of the handle is generally T-shaped to permit ready manual engagement by the player. Preferably, handle 52 is provided with a coil spring 53 wound about pin 54 and engaged between base 40 and handle 52 to normally bias the handle to its upright position shown in solid lines in Fig. 4.

Toy vehicle 14 (which is identical to toy vehicle 16 in construction) has a frame on which a plurality of wheels are rotatably mounted. The vehicle includes a body portion 14a which has a rear end 58 including an opening 60 formed therein. A drive wedge 62, formed of low friction material, such as Tevlar or Teflon, is mounted within body 14a of the vehicle and may be formed as an integral part of the vehicle frame. The drive wedge includes a flat, lower surface 64 which extends generally parallel to the horizontal surface of the track, and an upper, downwardly inclined surface 66 which forms the driving surface for the wedge. Surfaces 64 and 66 meet at a pointed apex 68 located at opening 60 in the vehicle body.

Lever 44 is balanced or weighted such that it is normally in the dotted line position shown in Fig. 4, i.e. with its lower surface 44c engaged against the surface of base 40. Its forward end 44d defines an apex with a slight upward incline. By this construction, when the toy vehicle moves rearwardly toward the launching device, apex 68 of drive wedge 62 enters below tip 44d of lever 44 and urges the lever upwardly in a counterclockwise direction into the solid line position shown in Fig. 4. This causes the rear end 48 of lever 44 to move downwardly against tongue 50 of handle 52 which, as mentioned, is normally maintained in its upright solid line position, shown in Fig. 4, by spring 53.

The vehicle is guided into engagement with lever 44 by a tongue 70 formed as an extension of base 40. Tongue 70 passes between the rear wheels of the vehicle, as shown in Fig. 4, to insure that the vehicle is properly aligned with the lever. When wedge 62 engages the forward end 42a of housing 42, movement of the vehicle is stopped and the vehicle is in position for launching. In this position, the player presses down sharply on handle 52 in a counterclockwise direction to quickly move the handle against the bias of spring 53 into the dotted line position shown in Fig. 4. This quick sharp motion drives lever 44 in a clockwise direction, from its solid line position to its dotted line position to apply a squeezing force against surface 66 of drive wedge 62, propelling the vehicle forwardly. The vehicle then enters the track, as shown in Fig. 2, and moves along the track until it completes its loop and moves up

ramp section 30 onto end track section 36 in the end position of the track. As shown in Figs. 5 and 6, end track section 36 has an abutment 38 which extends across the track to stop forward movement of the toy vehicle. Track section 36 is pivotally mounted by pins 80 or the like on pylons 82. The track section is balanced or weighted such that the abutment end of the track section is slightly heavier than the end to the right of pivot pins 80, as seen in Fig. 5. The adjacent ends 81, 82 of track section 36 and ramp 28 are shaped to engage each other and thereby cooperate to hold track section 36 normally in the horizontal position against counterclockwise movement beyond this horizontal position. Thus, section 36 is normally held in alignment with the remainder of the ramp section of the track so that it will receive the toy vehicle as it moves up the ramp. However, when the toy vehicle enters track section 36 the balance thereof is changed, and the weight of the toy vehicle causes track section 36 to pivot downwardly, in a counterclockwise direction, as seen in Fig. 7. This downward movement of track section 36 causes the toy vehicle to roll down the track section in the rearward direction, and back onto start section 26 of the track where it rolls backwardly into engagement with launching device 18. As seen in Figs. 5 to 8, the sidewalls 34 of the track and the start position have notches 84 formed therein to permit the pivotal movement of track section 36 to the position shown, and to stop the pivotal movement at that position. Once the toy vehicle has moved off track section 36, the weight of the track section and its balancing causes it to return to its upper horizontal position, as shown in Fig. 8. As this occurs, the toy vehicle enters launching device 18 and the launching device can then be operated by the player to drive the vehicle in the forward direction.

Accordingly, it is seen that a relatively simple constructed toy vehicle game apparatus is provided which automatically returns the toy vehicles to their associated launching devices so that they can be quickly and rapidly relaunched by a simple pivotal movement of handle 52. Of course, it will be appreciated that the toy vehicles and launching devices can be used separately without the specific track construction illustrated in the drawings.

#### CLAIMS

1. A combination comprising a toy vehicle and a launching device therefor, wherein the toy vehicle includes a body having an opened rear end and a drive wedge mounted within the body with its apex positioned adjacent the open end; and the launching device includes means for entering the rear end of the vehicle and applying a squeezing force to the wedge to drive the vehicle in a forward direction.
2. A combination as claimed in claim 1 characterized in that the wedge has a flat horizontal surface along the bottom of the vehicle and an upper downwardly inclined surface joining

the horizontal surface at the apex.

3. A combination as claimed in either of claims  
1 or 2 characterized in that the launching device  
5 includes a first pivoted lever having a wedge  
shaped launching end for engaging the drive  
wedge in the vehicle and a second lever for  
pivoting first lever when engaged with the drive  
wedge to apply the squeezing force to the  
vehicle's drive wedge to propel the vehicle  
10 forwardly.

4. A combination as claimed in claim 3  
characterized in that the second lever comprises a  
handle pivoted mounted in the launching device  
and operatively engaged with the lever to pivot  
15 the lever and apply said squeezing force.

5. A toy vehicle and launching device therefor  
substantially as hereinbefore described with  
reference to and as illustrated in the  
accompanying drawings.