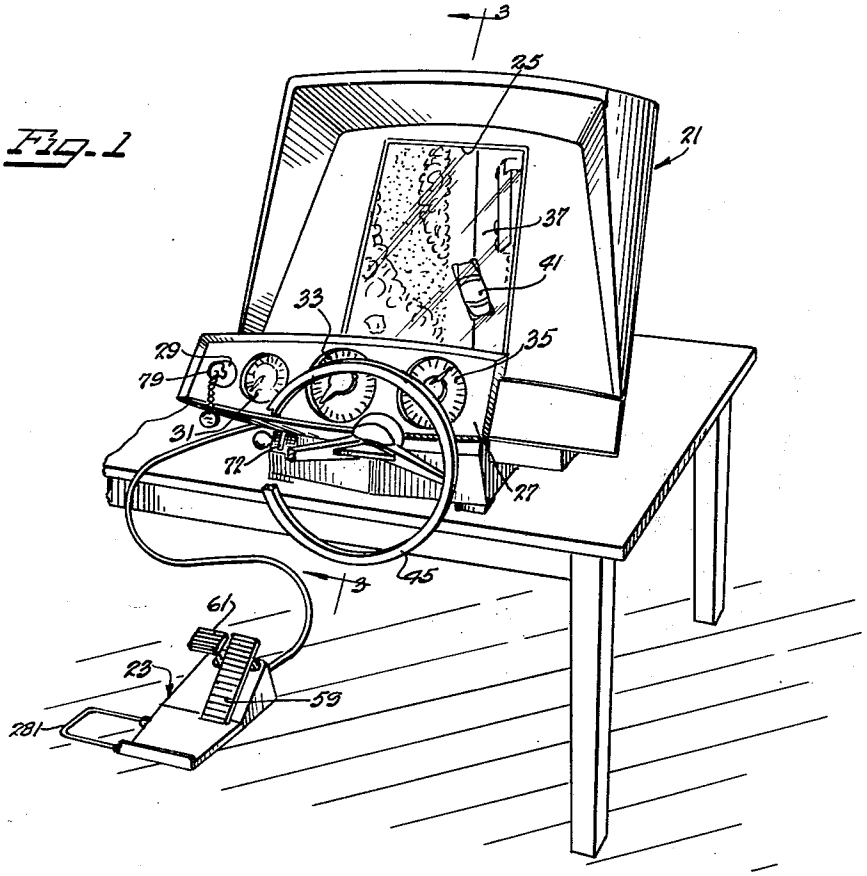
March 2, 1965 M. I. GLASS ETAL 3,171,215

DRIVER TRAINING APPARATUS

Filed Nov. 13, 1962

5 Sheets-Sheet 1

Fig. 1



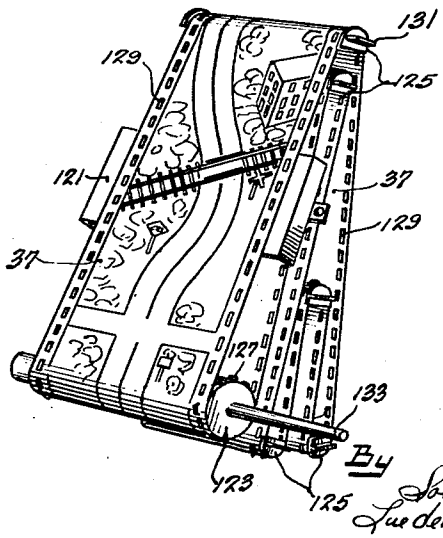


Fig. 2

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DRIVER TRAINING APPARATUS

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Fig. 4

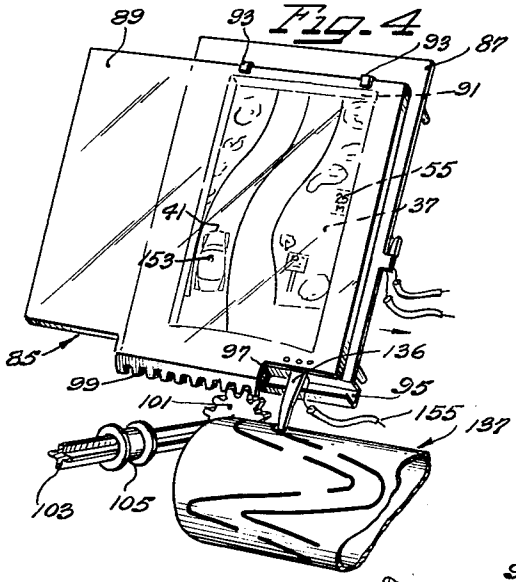
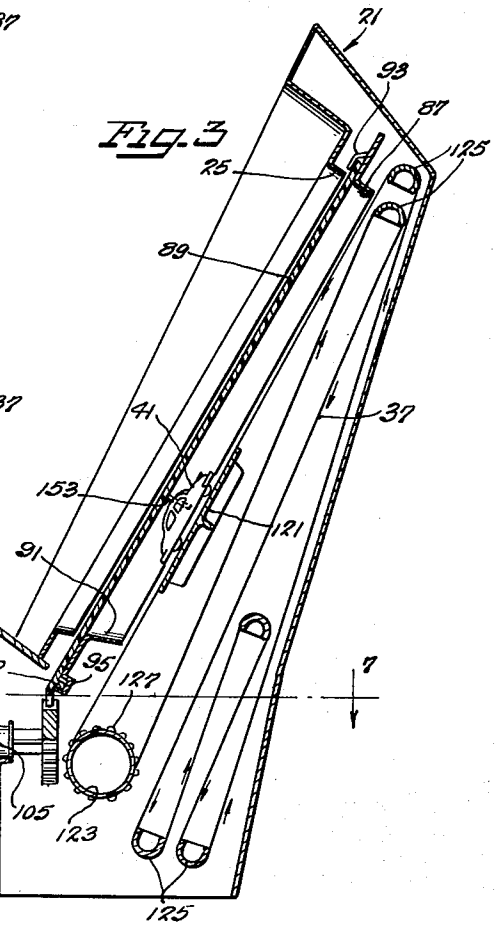
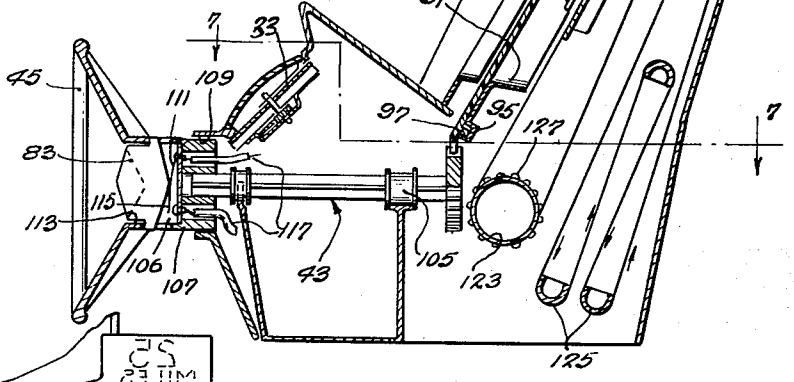


Fig. 3





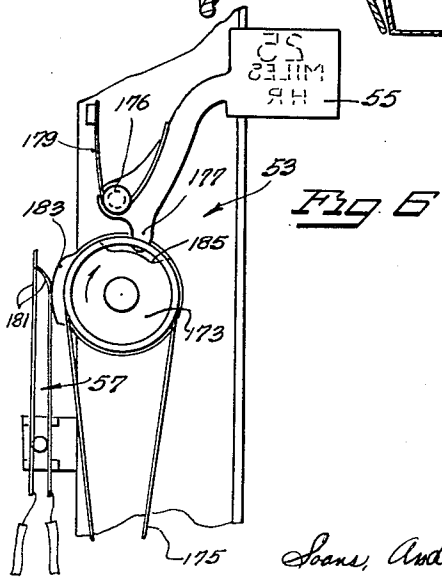


Fig 6

Fig. 5

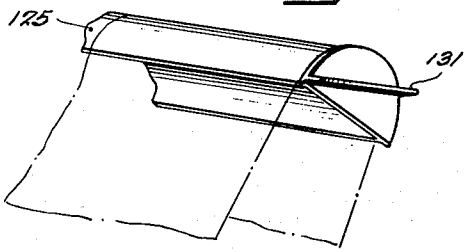


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Fig. 7

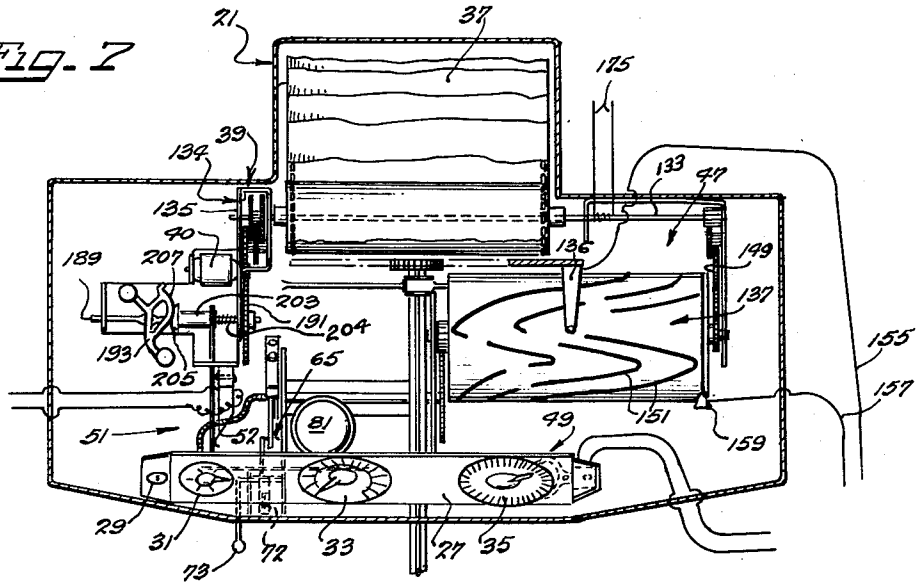


Fig. 8

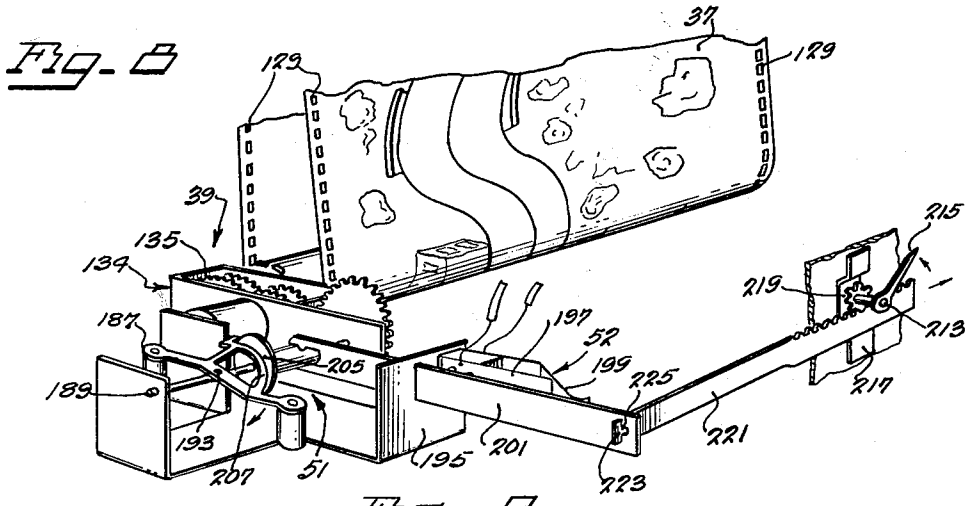
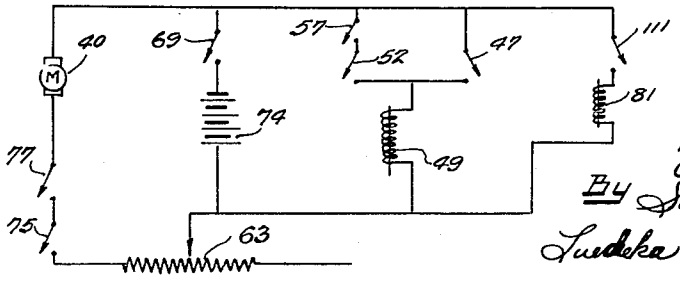


Fig. 9



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March 2, 1965 M. I. GLASS ETAL 3,171,215

DRIVER TRAINING APPARATUS

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Fig. 10

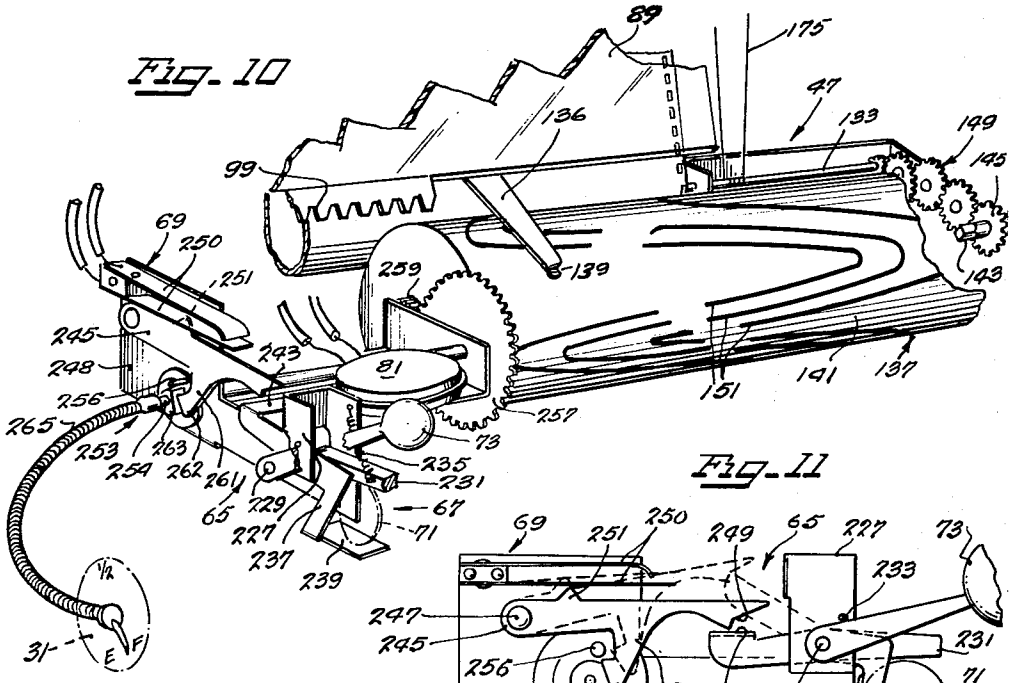


Fig. 11

Fig. 12

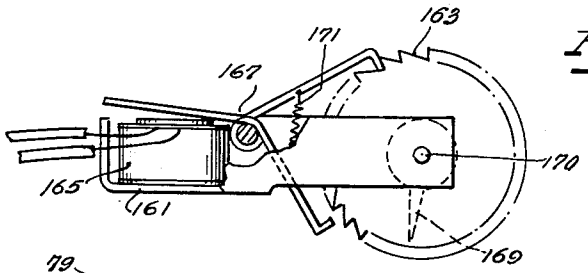


Fig. 13

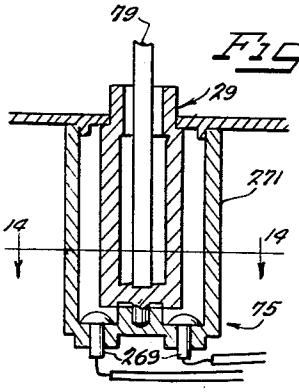
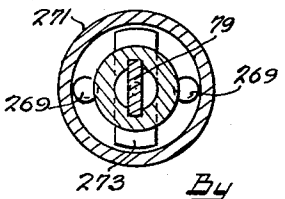


Fig. 14



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DRIVER TRAINING APPARATUS

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Fig. 15

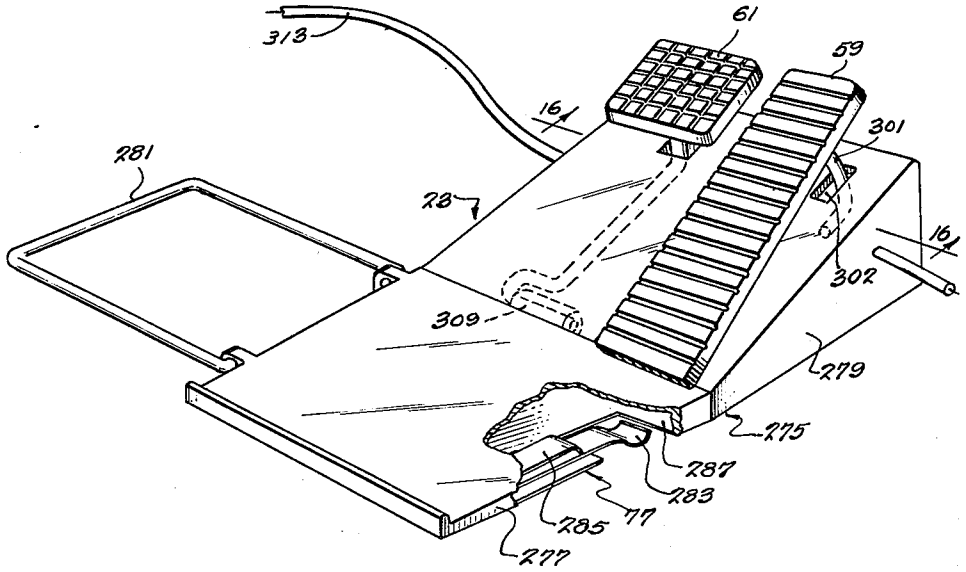
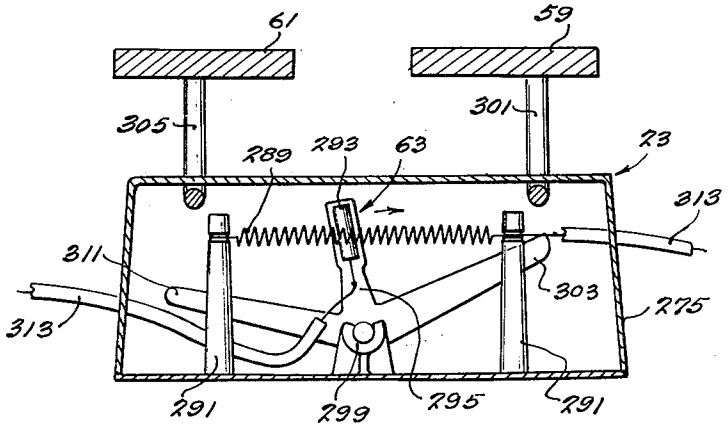


Fig. 16



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United States Patent Office

3,171,215
Patented Mar. 2, 1965

3,171,215

DRIVER TRAINING APPARATUS

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Filed Nov. 13, 1962, Ser. No. 236,879
7 Claims. (Cl. 35—11)

The invention relates to toys and more particularly to a toy or amusement device which simulates the operation of an automobile or other conveyance.

Children and grownups alike have long been fascinated by toys of the type which test one's skill in driving an automobile. In general, many such toys utilize an undulating panoramic path which is moved past a window through which the path can be viewed. A positionable automobile is usually provided which can be moved laterally across the window by a steering mechanism so that the player can attempt to maintain the conveyance on marked portions of the undulating, moving path. However, the only control generally provided for the manipulator of such a toy has been that of the steering device.

It is an object of this invention to provide an improved toy of this type having controls for directing an element along a moving path. A further object is to provide an improved amusement device which simulates the driving operation of a conveyance along a path. Another object of the invention is to provide such a toy which more realistically simulates the operation of a vehicle by providing a number of the controls normally associated therewith. A further object of the invention is to provide a toy of the above type which embodies a number of operable indicators normally associated with a vehicle, which indicators function in a manner corresponding to the actual indicators in such a vehicle. A still further object of the invention is to provide an attractive toy of the above type in which the visible movement of the vehicle along the path closely simulates the actual vehicle movement which would occur during driving operation. These and other objects of the invention are more particularly set forth in the following detailed description and in the accompanying drawings of which:

FIGURE 1 is a perspective view, partially broken away, of a toy embodying various of the features of the invention;

FIGURE 2 is a perspective view of the movable belt and its associated supporting structure;

FIGURE 3 is an enlarged sectional view taken along line 3—3 of FIGURE 1;

FIGURE 4 is a fragmentary perspective view, illustrating the steering and designating mechanisms;

FIGURE 5 is a fragmentary perspective view showing one of the belt supports;

FIGURE 6 is a fragmentary rear view, with parts being broken away, of the speed limit sign mechanism;

FIGURE 7 is a sectional view, with parts broken away, taken along the line 7—7 of FIGURE 3;

FIGURE 8 is a fragmentary perspective view, with parts broken away, showing the operation of the speedometer mechanism;

FIGURE 9 is a schematic showing of the electrical circuitry of the toy;

FIGURE 10 is an enlarged perspective view with parts broken away illustrating the designating and latching mechanisms;

FIGURE 11 is an enlarged side view of the coin operating mechanism as viewed from the left in FIGURE 10;

FIGURE 12 is an enlarged rear view of the scoring mechanism which is seen also in FIGURE 7;

FIGURE 13 is an enlarged top sectional view of the ignition lock device which is mounted on the dashboard and seen also in FIGURE 7;

FIGURE 14 is a sectional view taken along the line 14—14 of FIGURE 13;

FIGURE 15 is an enlarged perspective view, partially broken away, of the speed control device; and

FIGURE 16 is an enlarged sectional view taken along the line 16—16 of FIGURE 15.

An amusement device embodying various of the features of the invention is shown in FIGURE 1. This illustrated embodiment of the toy or amusement device has the form of a two-part structure which is designed for operation in a manner closely simulating the actual operation of an automobile. The toy includes a housing 21 which is designed for placement on a table top or a similar supporting surface so that a player can be seated in front of it, in a position approximating that of the driver of an automobile. A speed control device 23 is electrically connected to the housing 21 and is adapted to be placed on the floor below the table in a position where it simulates the foot pedals in an actual automobile. As thus placed, the speed control device 23 is easily operable by the feet of the driver. The housing 21 contains a central aperture or window 25 located in the front panel thereof at a position approximately level with the eyes of the driver. A dashboard 27 is formed as a part of the front of the housing 21 and is disposed just below the window. The dashboard 27 contains an ignition lock 29, a gas gauge 31, a speedometer dial 33, and a scoring dial 35.

Within the housing 21 an endless belt 37 is positioned behind the window 25, which belt 37 has portrayed upon its outward facing surface a sinuous path that generally takes the shape of a panoramic road through a small community and the surrounding countryside. The belt 37 is moved downwardly past the window 25 by a belt driving mechanism 39 which is powered by a power means or motor 40. The sight of the belt 37 moving past the window 25 presents a view which resembles the view that a highway will have to the driver of a moving vehicle. A toy automobile 41 is positioned against the belt 37 in a location where it will remain in full view through the window 25. The auto 41 is movable back and forth laterally across the window by a steering mechanism 43 which includes a steering wheel 45 that extends outwardly from below the dashboard of the housing in a manner similar to the steering wheel of an actual automobile. In response to the driver's turning of the steering wheel 45, the auto is moved to the right or to the left relative to the belt, whereby the driver attempts to follow the turns in the road and also avoid other obstructions therein.

In order to indicate each time the driver strays from the predetermined path, a designating mechanism 47 is provided within the housing 21. This designator 47 is linked to both the toy auto 41 and the endless belt 37 and operates by completing an electrical circuit each time the auto 41 strays from its predetermined path. To record the total number of times the auto 41 has strayed, the designating mechanism 47 is electrically connected with a scoring device 49 which includes the scoring dial 35 mounted on the dashboard 27.

A speedometer device 51, which includes the speedometer dial 33 mounted on the dashboard 27 is mechanically connected to the motor 40 in a manner so that it will move in corresponding relation to the degree of speed at which the motor 40 and the belt 37 are operating. The speedometer device 51 also includes a normally open electrical switch 52 which is adapted to close when the motor 40 reaches a certain speed.

A speed limit sign device 53 is provided which is mechanically connected to the belt driving mechanism 39 and which operates in connection with the speedometer 51. The speed limit sign device 53 is designed

to randomly pivot a speed limit sign 55 into the driver's view within the housing window 25 and simultaneously to close a normally open switch 57. If at the time the speed limit sign 55 appears and the switch 57 closes the driver is also driving at an excessive speed so as to cause the switch 52 to be closed, an electrical circuit will be completed causing the scoring device 49 to record points against the driver for speeding.

The speed control device 23 includes an accelerator pedal 59, a brake pedal 61, and a rheostat 63 which is electrically connected in series in the circuit containing the power means 40. Depression of the accelerator pedal 59 decreases the resistance within this circuit and depression of the brake pedal 61 increases the resistance, thus respectively raising or lowering the speed at which the belt 37 will move past the window.

To stop and start the toy, a latching means 65 is provided which, in association with a coin slot mechanism 67, is adapted to operate an electrical switch 69 included in the power circuit. After insertion of a coin 71 into a slot 72 provided in the housing 21, a nearby handle 73 can be pivoted, which handle closes the switch 69 completing one leg of the circuit that includes the motor 40 and its power source 74.

In order to further realistically simulate the operation of an actual motor vehicle, an ignition switch 75 and a safety switch 77 are also provided. The ignition switch 75 includes the ignition lock 29 mounted in the dashboard and is designed to complete another leg of the power circuit to the motor 40 when a key 79 has been inserted in the ignition lock 29 and turned. The safety switch 77 is the final switch provided in the power circuit, and closure of this switch in conjunction with the two previously mentioned switches completes the circuit, thereby starting the motor 40. The safety switch 79 is located within the speed control device 23 and is closed by the weight of the driver's foot upon the device. Inasmuch as the safety switch 77 is located near the accelerator pedal 59, this feature further simulates actual driving conditions wherein it is usually necessary for a driver to apply some pressure to the gas pedal while starting the motor.

One further feature of the toy is the provision of a horn 81 of the type found on most present day autos. The horn 81 is electrically operable by depressing a button 83 located in the center of the steering wheel 45.

Now referring more particularly to the drawings, the housing 21 contains an auto-positioning mechanism 85 (FIGS. 3 and 4) located between the housing window 25 and the belt 37. This mechanism 85 includes a stationary frame 87 and a movable transparent sheet member 89. The frame 87 contains a central aperture 91 substantially the size and shape of the window 25. The frame 87 is mounted by suitable brackets (not shown) provided on the inner walls of the housing in a position so that the aperture 91 is aligned with the window 25 To support the sheet member 89 for slidable movement, the frame 87 is provided with a pair of brackets 93 on its upper face near the top thereof and a lower trough 95. The top edge of the sheet member 89 is held beneath the brackets 93, and the lower portion of the sheet member 89 is held in place by an elongated lug 97 which is slidably received in the trough 95.

To provide for lateral movement of the sheet 89 in its supporting frame 87, the bottom edge of the sheet is formed in the shape of a toothed rack 99. The sheet member 89 is preferably made of a clear plastic from which it can be formed in one piece, although other transparent materials can be used. The teeth in the rack 99 are engaged by a steering gear 101 of the steering mechanism 43. The gear 101 is positioned in the vertical plane, mounted at one end of a horizontal steering shaft 103 which is rotatably supported by a pair of brackets 104, 105 connected to the housing 21. The

other end of the shaft 103 fits in an accommodating cavity 106 in rear of a steering wheel casing 107. The steering wheel 45 extends from the front portion of the casing 107. The casing 107 is cylindrical in shape and is rotatively seated in a proportionally shaped opening 109 formed in the front of the housing 21 at the lower edge of the dashboard 27.

The casing 107 also serves as a housing for the horn switch 111. In this connection, the horn button 83 is proportioned to slidably fit within a center aperture 113 in the steering wheel 45. The normally open electrical horn switch 111 is positoned in the casing 107 where it is closed by the inward movement of the horn button 83. The horn button 83 is biased outward by a spring blade 115 which serves as the movable contact of the horn switch 111. A pair of wires 117 connect the horn switch 111 to the electrical horn 81 and to the power supply 74 (FIG. 9).

To hold the endless belt 37 in alignment behind the frame aperture 91, a support plate 121 is provided which is mounted on the underside of the frame 87 (FIG. 3). The endless belt 37 is threaded between the frame 87 and the plate 121, over a drive cylinder 123 and over a series of arcuate support elements 125. Both edges of the drive cylinder 123 are provided with a ring of drive teeth 127 which mesh with proportionally spaced notched tracks 129 cut in both edges of the endles belt 37. The support elements 125 (FIG. 5) are fixedly supported on the inner walls of the housing 21 by suitable brackets (not shown) formed therein which engage the fianges 131 of the elements 125. The elements 125 can be made of any suitable material, but can preferably be made from a plastic such as rigid polyethylene which provides an arcuate surface over which the endless belt 37 will readily slip. The drive cylinder 123 is rigidly mounted upon a horizontal drive shaft 133 that is adapted to be driven clockwise (as viewed in FIG. 8). The drive shaft 133 is rotatably carried in a chassis 134 upon which the motor 40 is also supported. A gear box 135 (FIG. 7) connects the motor 40 to the drive shaft 133.

The designating mechanism 47, which is provided to indicate whether the driver has strayed from the predetermined path provided on the endless belt, includes a conductive finger 136 and a designating cylinder 137. The finger 136 depends from the movable sheet 89 to which it is fixedly mounted in a manner so that its tip 139 is always in contact with the surface 141 of the cylinder 137. The cylinder 137 is carried on a horizontal shaft 143 which is suitably journalled in the chassis 134. A gear 145 fixedly attached the right-hand side of the shaft 143 (as viewed in FIG. 7) drivingly connects the shaft 143 to the endless belt drive shaft 133 by means of a gear train 149. The gear train 149 is designed to rotate the cylinder 137 in the same direction as the belt drive cylinder 123 but at a considerably slower speed.

The outer surface 41 of the desginating cylinder 137 has marked thereupon a plurality of lines 151 which are laid out to correspond to the boundaries of the predetermined path inscribed on the endless belt 37. In the preferred embodiment, the designating cylinder is made of aluminum and has enamel or some like substance coated thereover to delineate the conductive lines 151. Alternatively, a conductive overlay or merely conductive strips could be used around a non-conductive cylinder to achieve a like result. The gear train 149 is designed to revolve the cylinder 137 one full turn for each complete revolution of the endless belt 37. Moreover, the cylinder is proportioned so that the path marked by the lines 151 on the outer surface 141 exactly duplicates the path marked for the auto 41 on the endless belt.

The auto is pivotably mounted on the underside of the sheet member by a pin 153. The auto 41 is disposed at a slight angle to the endless belt upon which it rests so that its rear wheels will engage the belt 37 with a greater

pressure than will its front wheels. This construction produces a more realistic illusion of the actual driving operation of an auto. As can be seen, the rear wheels will drag whenever the sheet **89** and auto **41** are moved laterally. Thus, the front end of the auto **41** will be pivoted in the direction to which the auto is being turned. This effect (FIG. 1) gives the illusion that the steering wheel **45** intricately controls the model auto **41** and actually effects the turning of the auto, to the great enjoyment of a young driver.

Inasmuch as the auto **41** and the conductive finger **136** are both connected to the sheet member **89**, any lateral movement of the auto is accompanied by similar lateral movement of the finger **136**. Thus by correct manipulation of the steering wheel **45** so that the auto follows the predetermined path on the endless belt **37**, a careful driver will simultaneously trace the correct path between the lines **151** on the designating cylinder **137** with the finger **136**. However, each time he fails to make the proper turn, the finger **136** will contact one of the lines **151**. When this occurs, the designator **47** operates as an electric switch. One wire **155** (FIG. 9) is connected to the finger **136**, and another wire **157** is connected to a brush **159** that is in contact with the aluminum edge of the cylinder **137**. Thus, whenever the finger **136** comes in contact with the metal surface that is exposed at the lines **151**, the electrical circuit containing the scoring device **49** and the power supply **74** (FIG. 9) is completed, and the scoring device **49** records a penalty point against the driver.

The provision of the designating mechanism **47** separate and apart from the pictorial belt **37** allows a more realistic effect to be achieved. As can be seen in FIGURE 7, the lines **151** need not be continuous, but can instead be broken at certain points. The breaks allow the driver some momentary leeway at certain points where a sharp deviation from the otherwise generally undulating path is required. These breaks are placed in positions corresponding to the points on the belt **37** where obstacles appear in the highway which must be quickly avoided, such as detours, construction projects, or a slow moving truck such as shown in FIGURE 1. Thus, at these points the penalty lines **151** are momentarily discontinued, giving the driver some chance to make the quick turn around the indicated obstruction without incurring a penalty.

The scoring device **49** which records the penalty points against the erring driver, is illustrated in detail in FIGURE 12. The device **49** is supported on the rear surface of the dashboard **27** and is located directly behind the scoring dial **35**. The scoring device **49** includes a small frame **161** which carries a toothed wheel **163**, a small electromagnet **165**, and an escapement element **167**. To visually indicate the score, a pointer **169** is provided which is connected by a common shaft **170** to the wheel **163**. The pointer **169** is associated with the numerically marked scoring dial **35** and indicates the points accumulated thereon. The escapment element **167** is biased clockwise (FIG. 12) by a spring **171** attached between its upper arm and the frame **161**. The electromagnet **165** is contained in the electrical circuit which is completed when the finger **136** touches the conductive surface of the cylinder **137**. When the electromagnet **165** is energized the escapement element **167** is rocked counterclockwise (as seen in FIG. 12), and the wheel **163** is accordingly stepped one notch. As soon as the circuit is broken between the finger **136** and cylinder **137**, the electromagnet **165** is de-energized allowing the spring **171** to rock the escapement element **167** clockwise to the position shown in FIGURE 12. From this position, the escapement element **167** is ready to step the wheel **163** and its connected pointer **169** another notch as soon as the electromagnet **165** is again energized. Upon completion of one cycle of the toy, which comprises one full revolution of the endless belt, the motor **40** is automatically shut off as will be explained hereinafter. At this time, the points that are indicated upon the scoring dial **35** are the total number of penalty points incurred by the driver. The scoring device **49** is designed so that the pointer **169** can be manually rotated clockwise (as pictured in FIGURE 12) back to the zero point, thus resetting it for the next driver.

Penalty points can be incurred in either of two ways. By straying from the pre-determined path, so that the finger **136** and designating cylinder **137** complete one circuit through the scoring device **49**, a penalty point is incurred as described above. A penalty point can also be incurred if the driver is caught speeding. In this respect, the speedometer switch **52** and the speed-limit sign switch **57** are connected in series and are located in a second circuit containing the scoring device **49** (FIG. 9). Whenever both switches **52, 57** are closed at the same time, the scoring device **49** is likewise stepped through this circuit.

The speed-limit sign device **53** is mounted on the right hand side of the frame **87** and is adapted to pivot the speed-limit sign **55** into the view of the driver near the right-hand edge of the aperture **91** (FIG. 4). The speed-limit sign device **53**, as viewed from the rear in FIGURE 6, includes a generally circular cam **173** which is rotatably mounted on the frame **87** and which is driven by a thin flexible belt **175** which passes around the drive shaft **133**, as seen in FIGURE 7. The speed limit sign **55** is pivotally mounted on the frame by a pin **176** and contains a depending ear **177**. A hair spring **179** is disposed about the pin **176** and biases the speed-limit sign **55** to a position where the ear **177** engages the peripheral surface of the cam **173**. The normally open electric switch **57** is mounted on the frame **87** and contains a pair of contacts **181** which lie adjacent the cam. The cam **173** contains a raised camming surface **183** and a notch **185**. As the cam **173** is slowly rotated clockwise (FIGURE 6), the ear **177** falls into the notch **185** just before the raised camming surface **183** presses the contacts **181** together. Thus, the speed limit sign is pivoted into view through the window shortly before the switch **57** is closed. As can be seen in FIGURE 9, this switch **57** partially completes the second circuit to the scoring device **49**.

The speedometer device **51** is mounted on the chassis **134** and contains a governor **187** mounted on a horizontal shaft **189** which is rotatably journalled in the chassis (FIGS. 7 and 8). A gear **191** on the shaft **189** connects it to the motor **40**. The governor **187** is pivotably mounted on a flattened portion of the shaft **189** by a pin **193** so that the governor spins in a generally vertical plane as the shaft **189** revolves. The speedometer switch **52** is mounted on an upstanding bracket **195** of the chassis and contains a fixed contact **197** and a spring blade contact **199** which is designed to be biased to the closed position. The switch **52** is held open by a horizontal bar **201** which is mounted in an appropriate aperture in the upstanding bracket **195** adjacent the switch. The mounting is such that the bar pivots in a horizontal plane. The bar **201** is appropriately pinned at its rearward end to a sleeve **203** which is slidably carried on the governor shaft **189**. A coil spring **204** is provided, disposed about the shaft **189** between the sleeve **203** and the chassis **134**. This spring **204** biases the sleeve **203** to the left (as shown in FIGURE 7) and accordingly biases the bar **201** in the counterclockwise direction. The spring **204** is of sufficient strength to overcome the spring action of the blade contact **199** and thus holds the speedometer switch **52** open. The opposite end of the sleeve **203** has a mushroom-like disk **205** affixed thereto which abuts a camming surface **207** provided on the governor **187**. The biasing action of the spring **204** likewise forces the arcuate disk **205** against the camming surface **207** of the governor. The pressure of the disk **205** against the camming surface **207** pivots the governor **187** in a counterclockwise direction (as viewed in FIGURE 7). As the governor **187** is pivoted the sleeve **203** moves farther to the left, allowing the horizontal bar **210** to open the switch **52**, as described

above. As the motor 40 is operated and the shaft 189 is rotated, the weighted governor 187 swings clockwise so that the camming surface 207 acts against the disk portion 205 of the sleeve. The sleeve 203 is forced to the right as the biasing action of the coil spring 204 is overcome. This lateral displacement of the sleeve 203 to the right accordingly pivots the bar 201 clockwise. At a predetermined speed of the motor, the bar 201 will have pivoted a sufficient distance to allow the spring blade contact 199 to close the speedometer switch 52.

A visual indication of this simulated speed of the auto is shown by the speedometer 33 which is mounted on the dashboard. To accomplish this result, a shaft 213, which carries the speedometer pointer 215, is provided which extends rearwardly behind the speedometer. This shaft 213 is journalled in a bracket 217 attached to the rear face of the dashboard 27. To operate the speedometer, a rack and pinion mechanism is provided. The pinion 219 is affixed to the shaft 213, and the rack 221 is slidably supported by the bracket 217 so that it engages the pinion 219 at its bottom. A tab 223 on the end of the rack 221 resides in an appropriately formed slot 225 in the bar 201, linking the rack 221 to the bar 201. Thus the clockwise pivoting of the bar 201, caused by the action of the governor 187, is transmitted to the rack 221 as lateral displacement to its left. This movement of the rack rotates the pinion 219 and the pointer 215 clockwise, indicating the simulated m.p.h. reading on the speedometer.

The toy is designed so that before play can be begun a coin 71 must be inserted through the coin slot 72 into the coin slot mechanism 67. The coin slot mechanism 67 operates the latching means 65 and the off-on switch 69. After the coin has been received in the coin slot mechanism 67, manual downward pivoting of the operating handle 73 latches the latching means 65 to hold the off-on switch 69 in closed or "on" position.

The coin slot mechanism 67 includes a vertically disposed U-shaped bracket 227 formed as a part of the chassis 134. Journalled in the bracket 227 is a shaft 229, one end of which fixedly carries the handle 73 at a position outside the bracket flanges. A bar 231 is fixedly attached to the central portion of the shaft 229, disposed between the flanges of the bracket 227. A stop 233 is located on the outer surface of the bracket 227 in a position where it will engage the handle 73. The stop is so located above the handle that it maintains the bar 231 in position a few degrees above horizontal. The bar and handle arrangement is biased to this upper position by a spring 235 attached between the bracket 227 and the bar 231. A generally Z-shaped lever 237 is provided which is supported on the shaft 229 for rocking movement. The lever 237 is located adjacent the bar 231 between the flanges of the bracket 227 and contains a platform 239 at one end. When the lever is in the position shown in FIGURES 10 and 11, the platform 239 is spaced below the bar 231 in generally parallel relation thereto. The bar 231 and platform 239 are aligned with the coin slot 72 so that when a coin 71, such as a penny, is inserted through the slot, it will come to rest between the platform 239 and the bar 231 in the receptacle formed thereby. A flange 241 is provided on the lever 237 to form the rear of the receptacle. The lever 237 and the adjacent flange of the bracket 227 form the receptacle sides. A generally horizontal arm 243 is provided at the other end of the lever 237, which arm serves as one-half of the latch. The cooperating half of the latch includes a generally T-shaped element 245 which is pivoted at the end of one arm on a pin 247 set in a vertical surface 248 of the chassis 134. The free arm of the T-element 245 contains a notch 249 which is disposed to engage the arm 243 in latching relation. The off-on switch 69 is located on the vertical surface 248 of the chassis in a position above the T-element 245 and contains a pair of blades 250 designed to remain in normally open position. An ear 251 is provided on the top of the T-element 245 which engages the bottom blade 250 and closes the switch 69 by forcing this blade upward when the latching means 65 is moved into the latched position.

In operation, when a coin 71 has been inserted through the coin slot 72 so that it resides in the receptacle between the bar 231 and the platform 239, the coin 71 serves as a link between the handle 73 and the latching means 65. Thus, when the handle 73 is pivoted downward, the bar 231 forces the coin against the platform 239 thereby pivoting the Z-lever 237 clockwise (FIGURE 10), forcing the arm 243 into latching engagement with the notch 249 in the T-element. This operation closes the off-on switch 69, as shown in dotted outline in FIGURE 11. The switch 69 is held in this closed position until the latching means 65 has been unlatched. The closed switch 69 completes the first leg of the electrical circuit connecting the power supply 74 to the motor 40 (FIGURE 9).

A mechanism 253 which is provided to operate the gas gauge 31, is also utilized to unlatch the latching means 65, and thereby ultimately open the switch 69, halting the operation of the toy. This gas gauge mechanism 253 includes a shaft 254 which is journalled in the chassis 134 below the T-element 245. One end of the shaft 254 has a disk 255 affixed thereto which disk carries a pin 256 extending outwardly therefrom. The opposite end of the shaft 254 carries a gear 257 which meshes with a pinion 259 affixed to the shaft 143 of the designating cylinder. Thus, as the designating cylinder 137 is driven, the shaft 254 and the disk 253 are slowly rotated in counterclockwise direction, as shown in FIGURE 11. The T-element 245 has a lower leg 261, the bottom of which is shaped into a rounded V-point 262. The disk 253 includes a hub 261, a portion of which is flattened to serve as a stop for the T-element 245 when the latching means 65 is in its unlatched position, as shown in FIGURE 10. Thus the hub 263 maintains the T-element 245 in a position where it will not interfere with the operation of the Z-lever 237.

When the T-element 245 has been latched by the lever arm 243 (dotted position, FIGURE 11) closing the off-on switch 69, the motor 40 drives the designating cylinder 137, and the disk 255 slowly rotates. As the disk 255 nears one full revolution, the pin 256 engages the V-tip 262, forcing the T-element 245 upward. As the T-element 245 is raised, the lever arm 243 drops out of the notch 249, allowing the Z-lever 237 to return to the position shown in FIGURE 10. Rotation of the disk 255 continues because the pin engages the side of the V-tip 262, thus retaining the ear 251 in its poistion against the blades of the switch 69. When the pin 256 reaches the upper edge of the tip 262, the T-element falls, opening the switch 69 and accordingly breaking the circuit to the motor 40. This halts the operation of the toy, and another coin must be inserted before it can be started again.

To move the gas gauge 31, a flexible cable 265 is provided. The cable 265 is attached at its one end to the shaft 254 and at its other end, to the gas gauge 31. Thus, the cable 265 transmits the rotation of the shaft 254 to the gas gauge, thereby moving the gas gauge pointer from the "full" position counterclockwise to the "empty" position, duplicating the operation of the gas gauge in an actual automobile. Thus, the gas gauge 31 indicates to the driver the approximate percent of playing time left in his turn.

Another of the realistic features of an automobile that is included in the toy, is the ignition lock 29 (FIGURE 13). This lock 29 forms a part of the ignition switch 75 and is positioned on the dashboard 27 in a location similar to that on many automobiles. This lock 29 is adapted for use with the ignition key 79 which can be inserted therein and turned clockwise as in an actual automobile. The switch 75 includes a pair of contacts 269 mounted in a housing 271 attached to the rear of the dashboard.

The contacts 269 are adapted to be bridged by a rotatable conductive element 273 carried by the ignition lock 29. Thus, turning the key 79 from its straight-up position (shown in FIGURES 13 and 14) clockwise about 90° bridges the contacts 269 and completes one more leg of the circuit to the electric motor 40.

The safety switch 77 (FIG. 15) that completes the third leg of the circuit (FIGURE 9) to the motor 40 is incorporated in the speed control device 23, as is the rheostat 63 which governs the speed at which the motor 40 will operate. The speed-control device 23 includes a housing 275 having a generally flat front portion 277 and a raised sloping rear portion 279. Thus the housing 275 provides a structure similar to that found in normal automobiles which utilize a sloping wall beneath the foot pedals. The accelerator pedal 59 and the brake pedal 61 are accordingly located on the sloping rear portion 279. The two pedals 59, 61 are adapted to both be operated by the right foot of the driver, as is correct procedure in the proper operation of an automobile. To help maintain the speed-control device 23 in its proper position and to assure that the driver's left foot is not used to operate the brake pedal, a footrest 281 is provided attached to the left-hand side of the housing 275. By keeping his left foot upon the footrest 281, the driver assures steady positioning of speed control device 23.

The safety switch 77 is contained in the front portion 277 of the housing and includes a pair of blade-like contacts 283, 285. The bottom contact 283 is biased downwardly away from the upper contact 285 and is adapted to touch the floor through an aperture 287 in the bottom of the housing 275. The strength of the biasing is sufficient to raise the speed-control device 23 slightly off the floor on one side and keep the switch 77 in normally open position. As can be seen, the construction is such that the weight of the driver's right foot upon the housing 275 easily closes the switch 77, thus completing the third leg of the circuit to the motor 40. This switch 77 thereby operates as a safety device which opens the power circuit to the motor 40 any time the driver removes his foot from the brake-accelerator area.

The actual speed-control is accomplished by the accelerator pedal 59 and the brake pedal 61 which are used to manipulate the rheostat 63 that is included in series in the circuit containing the motor 40 and power supply (FIGURE 9). In this connection, the rheostat 63 comprises a fixed electrical resistance 289 mounted between a pair of upright supports 291 within the rear portion of the housing and a slidable contact 293. The slidable contact 293 is mounted on the middle leg 295 of a generally Y-shaped element 297 which is pivotally supported in a suitable stand 299 positioned between the pair of uprights 291. The accelerator pedal 59 is pivotally supported at its lower end by a bracket and spring (not shown) which serves to bias the pedal 59 to the raised position. The upper end of the pedal 59 has a rod 301 depending therefrom, which passes through a hole 302 in the housing 275. The rod 301 has its end bent to a position where it engages an arm 303 of the Y-element whenever the accelerator pedal 59 is depressed. The brake pedal 61 is supported on a rod 305 which depends from the underside of the pedal 61, passing through a hole 307 in the housing 275. The brake rod 305 has its end bent to fit into a bracket 309 secured to the housing floor. The bracket 309 contains a coil spring (not shown) which biases the brake pedal 61 to its raised position. The brake rod 305 is located so that it will engage the other arm 311 of the Y-element when the brake pedal 61 is depressed, pivoting the Y-element counterclockwise, as viewed in FIGURE 16.

The rheostat 63 is connected into the motor circuit by a pair of wires 313 connected to the slidable contact 293 and to the right hand side of the resistance 289 (FIGURE 16). Accordingly, as the accelerator pedal 59 is depressed, the Y-element 297 is pivoted clockwise, reducing the amount of resistance in the circuit and causing the motor 40 to gain speed. When foot pressure is removed from the accelerator pedal and applied instead to the brake pedal 61, the slidable contact 293 is moved to the left, increasing the resistance in the circuit and causing the motor 40 to lose speed.

In the overall operation of the toy, a penny 71 is inserted through the slot 72 into the mechanism 67 where it falls into position between the bar 231 and the platform 239. When the handle 73 is depressed, the presence of the coin 71 causes the latching means 65 to be latched into position closing the off-on switch 69 that comprises the first leg of the power circuit to the motor 40. As the handle 73 is released by the player, the spring 235 returns it to its raised position and the penny 71 falls to a coin box (not shown) below. Next the driver places his right foot on the speed control device 23 near the accelerator pedal 59 and turns the ignition key 79. This action closes the safety switch 77 and the ignition switch 75 respectively, completing the circuit containing the motor 40 and power supply 74.

Thus the motor 40 runs and drives the endless belt 37 downward past the window 25 and slowly turns the designating cylinder 137 in a like direction. As the driver turns the steering wheel 45 in his attempt to maintain the model automobile 41 on the sinuous path illustrated on the belt 37 and to avoid the numerous obstructions, the scoring device 35 records a point against him each time he strays from the preselected path. When the speed limit sign 55 randomly appears, points are also recorded against the driver if the speedometer switch 52 is also closed as a result of his driving at too high a rate of speed.

Thus the invention provides a toy which closely simulates the driving operation of an automobile. While providing a toy which is designed to create many hours of competitive enjoyment for youngsters and oldsters alike, the invention also provides a device which at the same time teaches youngsters the rudiments of the operation of an automobile. The provision of the steering wheel, horn, ignition key, brake pedal, accelerator pedal, gas gauge and speedometer add definite realism to the operation of the toy.

The provision of the novel method of scoring penalty points against the driver for speeding makes the toy especially suitable for use in conjunction with a wristwatch or a clock having a second hand. In this respect, a simple table can be provided in which a specified number of seconds of driving time are made equivalent to one or more penalty points. In this manner, a certain base time can be set up that will correspond to operation of the toy at a speed just below the penalty speed. If the driver's time exceeds this predetermined time, the corresponding number of these points are added to the driver's score for additional time he has used. Thus, the driver is penalized who operates at too slow a speed. Such a penalty system makes the speed limit sign a more important device so that a player will drive faster during the intervals when the sign is not visible in order to attain the best score.

Various of the features of the invention are set forth in the following claims.

What is claimed is:

1. An amusement device simulating the operation of a vehicle, which device comprises a housing, a movable member which has a surface including a portion simulating an endless path and which is supported within said housing for movement in one direction, a vehicle mounted on said housing for movement in a direction generally transverse to the direction of movement of said movable member which vehicle has front and rear wheels positioned adjacent to and above said surface, said vehicle being pivotally mounted on said housing with said rear wheels bearing against said surface with a greater frictional pressure than said front wheels so that the front end of said vehicle turns in the direction to which said

vehicle is being moved, steering means mounted on said housing and operatively connected to said vehicle to effect movement thereof, and power means mounted within said housing and drivingly connected to said movable member.

2. An amusement device designed for use in conjunction with an electric power supply, which device comprises a housing, a movable member which has a surface simulating an endless sinuous path and which is movably supported within said housing, an element mounted adjacent to and above said surface for movement in a direction generally transverse to the direction of movement of said movable member, means mounted on said housing and operatively connected to said element to effect movement thereof, means linking said element and said movable member for designating when said element has deviated from said path, said designating means including a rotatable cylinder having a conductive surface portion delineating a path corresponding to the sinuous path portrayed on said movable member and also including a conductive finger connected to said element for movement therewith, power means mounted within said housing and drivingly connected to said movable member and to said cylinder so as to rotate said cylinder relative to the movement of said movable member, indicating means mounted on said housing, and means completing an electrical circuit between the power supply and said indicating means through said designating means in response to contact between said finger and said conductive cylinder surface portions.

3. An amusement device simulating the operation of a conveyance, which device comprises a housing, a movable member which has a surface including a portion simulating an endless path and which is movably supported within said housing, a conveyance element mounted adjacent to and above said surface for movement in a direction generally transverse to the direction of movement of said path, means mounted on said housing and operatively connected to said element to effect movement thereof, power means mounted within said housing and drivingly connected to said movable member, control means connected to said power means for selectively varying the speed of movement of said movable member, a fuel gauge having a movable indicator mounted on said housing, and means linking said fuel gauge indicator to said movable member so that said gauge indicator moves from full position to empty position relative to the length of travel of said movable member.

4. An amusement device which comprises a housing having a window formed therein, a movable member which has a surface simulating an endless path and which is movably supported within said housing below said window, an element mounted adjacent to and above said surface for movement in a direction generally transverse to the direction of movement of said movable member, means mounted on said housing and operatively connected to said element to effect movement thereof, power means mounted within said housing and drivingly connected to said movable member, control means connected to said power means for selectively varying the speed of movement of said path member, a speed-limit sign mounted in said housing for pivotal movement into view through said window, means linking said sign and said movable member for pivoting said sign, and means connected to said sign-pivoting means and to said power means for indicating penalties pursuant to the operation thereof.

5. An amusement device simulating the operation of a vehicle, which devices comprises a housing having a window formed therein, a movable member which has a surface including a portion simulating an endless path and which is supported within said housing below said window for movement in one direction, a vehicle mounted adjacent to and above said surface for movement in a direction generally transverse to the direction of movement of said movable member, steering means mounted on said housing and operatively connected to said element to effect movement thereof, power means mounted within said housing and drivingly connected with said movable member, control means connected to said power means for selectively varying the speed of movement of said movable member, a speed-limit sign mounted in said housing for pivotal movement from a concealed position to a position in view through said window, means linking said sign and said movable member for pivoting said sign, penalty scoring means mounted on said housing, governor means connected to said power means, and operating means linking said sign-pivoting means, said governor means, and said scoring means for actuating said scoring means when said sign has been pivoted to the visible position and said power means exceeds a preselected speed.

6. An amusement device designed for use in conjunction with an electric power supply, which device comprises a housing, a movable member which has a surface simulating an endless sinous path and which is movably supported within said housing, an element mounted adjacent to and above said surface for movement in a direction generally transverse to the direction of movement of said movable member, means mounted on said housing and operatively connected to said element to effect movement thereof, means linking said element and said movable member for designating when said element has deviated from said path, said designating means including a rotatable cylinder havnig a conductive surface marked to delineate a path corresponding to the sinuous path portrayed on said movable member and also including a conductive finger connected to said element for movement therewith, power means mounted within said housing and drivingly connected to said movable member and to said cylinder, scoring means mounted on said housing, and means completing an electrical circuit between the power supply and said scoring means through said designating means in response to predetermined positioning of said finger upon said cylinder surface.

7. An amusement device simulating the operation of a vehicle and adapted for use with an electric power supply, which device comprises a housing, a movable member which has a surface including a portion simulating an endless path and which is supported within said housing for movement in one direction, a vehicle mounted adjacent to and above said surface for movement in a direction generally transverse to the direction of movement of said movable member, a steering wheel mounted on said housing and operably connected to said vehicle to effect movement thereof, an electric motor mounted within said housing and drivingly connected with said movable member, control means electrically connected with said motor and operable to selectively vary the speed of said motor, said control means including a rheostat, an accelerator pedal, and a brake pedal, scoring means mounted on said housing, means linking said vehicle and said movable member and operable to determine when said vehicle has deviated from said path and to actuate said scoring means pursuant thereto, a speedometer mounted on said housing and connected to said motor for registering to reflect the speed of said motor, a speed-limit sign pivotally mounted in said housing, means connected to said sign and to said movable member for randomly pivoting said sign, means connecting said speedometer, said sign-pivoting means and said scoring means and operable to actuate said scoring means, and switching means electrically connected to said motor and power supply and operable to actuate said motor, said switching means including a foot-operable switch, a key-lock ignition switch, and a coin-operated switch.

(References on following page)

References Cited in the file of this patent

UNITED STATES PATENTS

2,148,828	Myers	Feb. 28, 1939
2,265,598	Firestone et al.	Dec. 9, 1941
2,269,444	Durham et al.	Jan. 13, 1942
2,273,091	De Silva	Feb. 17, 1942
2,700,227	Arkell et al.	Jan. 25, 1955
2,742,714	Allgaier	Apr. 24, 1956
2,908,087	Weinreich et al.	Oct. 13, 1959
2,979,831	Bullock	Apr. 18, 1961
3,000,111	Heylmun	Sept. 19, 1961

FOREIGN PATENTS

322,268	Great Britain	Dec. 5, 1929
452,735	Great Britain	Aug. 28, 1936
820,165	France	Nov. 5, 1937
714,921	Great Britain	Sept. 8, 1954