Oct. 1, 1968 P. SHELDON ET AL 3,403,908

DRAG STRIP FOR SLOT RACERS

Filed Nov. 8, 1965

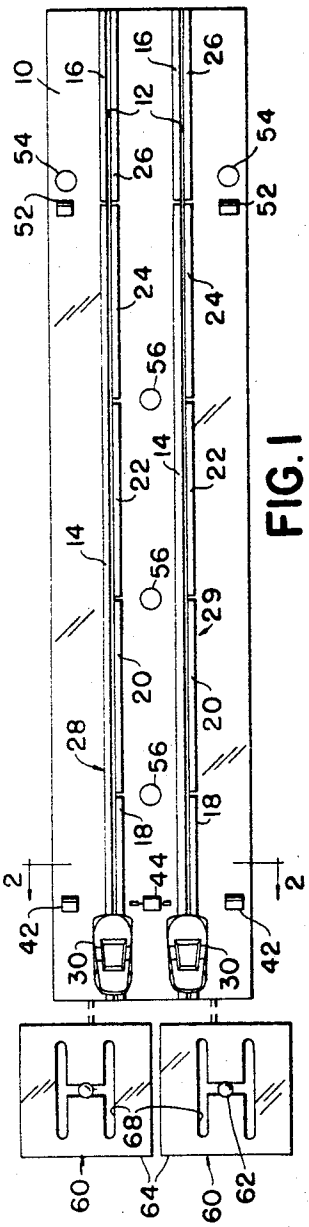

FIG. 1

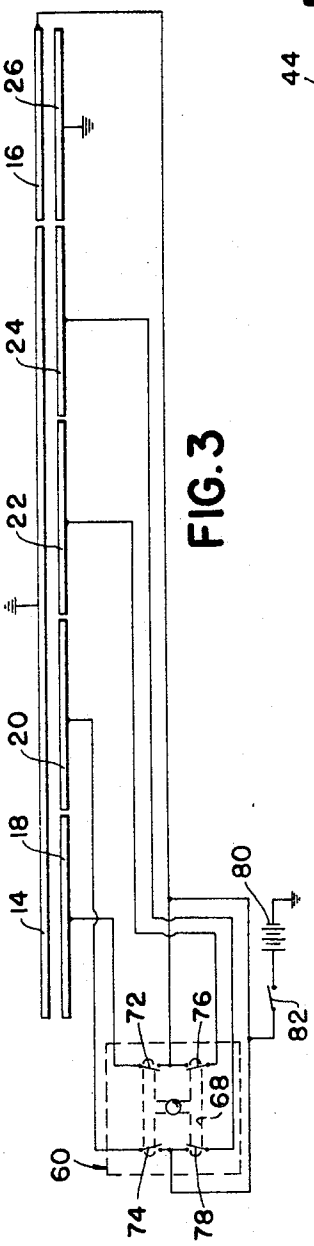

FIG. 3

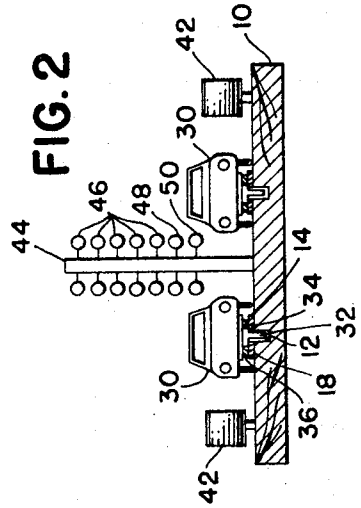

FIG. 2

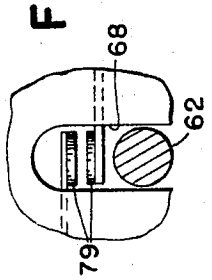

FIG. 5

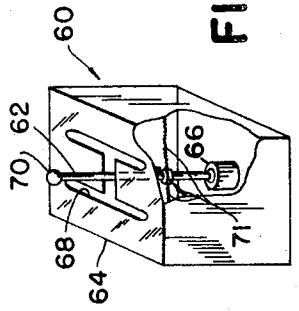

FIG. 4

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United States Patent Office 3,403,908
Patented Oct. 1, 1968

3,403,908

DRAG STRIP FOR SLOT RACERS

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Filed Nov. 8, 1965, Ser. No. 506,734
1 Claim. (Cl. 273—86)

ABSTRACT OF THE DISCLOSURE

Drag strip for slot racing cars in which operators control their respective cars. For each slot track a series of sections have switches connected to electrical power such that the operator must coordinate the closing of the particular section switch with the position of the car to supply power. The operator moves simulated gear shifts to close the switches. When the car reaches the end of the strip an oppositely poled voltage acts as a brake through contact strips. Photocell actuated winner lights indicate the first car to cross the finish line.

This invention relates to a toy racing track for slot racers and particularly to a drag strip for a pair of electric-powered slot racers wherein the progress of each racer along the track is controlled by a simulated gear shift mechanism.

The electric power supplied to each racer is controlled by a gear shift switch mechanism like the gear shift housing utilized in a real drag racer. In order to race the toy automobile down the track within a minimum time it is necessary to shift or move the gear shift lever through gear shift positions analogous to first speed, second speed, third speed, and fourth speed gear positions in a real gear shift as the racer progresses toward the finish line. Each shift must be made when the racer reaches a predetermined position on the track in order to keep the elapsed time to a minimum. If the shifts are made too early or too late, the power supplied to the racer is cut off and the racer loses speed, with the consequence that the elapsed time from start to finish is increased. The requirement that the shifts be made at an exact time demands a degree of skill like that required in driving a real drag strip racer, and accordingly increases the reality of the toy. The invention is also provided with novel means for automatically slowing the slot type racers after they have crossed the finished line so as to prevent them from traveling off the track.

Accordingly, an object of the invention is to provide a toy drag strip for slot type racers.

A further object is to provide a toy drag strip wherein the racers are automatically braked after crossing the finish line.

Other objects and features of the invention will become apparent as the description proceeds, especially when taken in conjunction with the accompanying drawings, illustrating a preferred embodiment of the invention, wherein:

FIGURE 1 is a top plan view of a toy drag strip according to the invention;

FIGURE 2 is a sectional view taken along line 2—2 of FIGURE 1;

FIGURE 3 is a circuit diagram for the toy drag strip;

FIGURE 4 is a partially broken away perspective view of the simulated gear shift housing; and

FIGURE 5 is an enlarged sectional view of a portion of the gear shift housing and showing one of the control switches.

As shown in FIGURE 1, the drag strip comprises an elongated track member **10** with two parallel guide grooves or slots **12** therein extending the length of the track. Contact strips **14** and **16** are located immediately

to one side of each slot **12** and contact strips **18, 20, 22, 24** and **26** are positioned immediately adjacent the other side of each slot. As illustrated, contact strip **14** extends from the starting position at the left end of the track shown in FIGURE 1 to the finish line located adjacent the right-hand end of the track. Strip **16** extends from the finish line to the right-hand end of the track. On the other side of each slot **12** contact strips **18, 20, 22** and **24** are positioned in end-to-end relationship to form series of contact strips running from the starting line to the finish line. Contact strip **26** is opposite contact strip **16** and extends from the finish line to the right-hand end of the track. The two slots **12** and their associated contact strips define two identical racing lanes **28** and **29** on track **10**.

The slots **12** in each lane serve to define the path followed by slot type racers as they are raced from the starting line to the finish line. As shown in FIGURE 2, a slot racer **30** is positioned over each slot **12** and is provided with a locating member **32** which extends downwardly from the front end of the racer **30** into the slot **12** so as to guide the racer along the track. The racer carries flexible electric contacts **34** and **36** positioned on each side of the member **32** so that contact **34** makes electrical contact with contact strips **14** and **16**, and contact **36** makes electrical contact with contact strips **18, 20, 22, 24** and **26** as the racer moves down the slot in the track.

The slot racers **30** may be of a conventional construction, including an electric drive motor which drives the rear wheels thereof so as to power the racer. The drive motor in the racer is powered by electricity drawn from the contact strips on opposite sides of the slot **12** by contacts **34** and **36** as the racer moves along the track.

Photocells **42** are positioned at each side of the lanes **28** and **29** at the starting line and are used to indicate if a racer has crossed the starting line prior to the start of the race. A starting tree **44** is positioned at the starting line between lanes **28** and **29** and, as shown in FIGURE 2, carries a set of starting signals for each racer. Each set includes a number of amber signal lights **46**, a green starting light **48**, and a red foul light **50**. The tree serves as a timer for the starting of a drag race by blinking of the lights at set intervals to time the start. The lights are blinked on from the top of the tree downwardly, and the race begins when the green lights **48** are turned on. If a racer crosses the starting line before the green lights are turned on, the appropriate starting photocell **42** senses the premature start and turns on the appropriate red foul light **50**, which indicates that the prematurely started racer has forfeited the race.

Finish photocells **52** are located on either side of the track at the finish line and serve to indicate which of the racers **30** finishes first. When the lead car crosses the finish line it trips the appropriate finish photocell **52** which lights the appropriate winner light **54** to indicate which racer won the drag race. Indicator posts **56** are positioned between the slots **12** and serve to locate the junctions between contact strips **18** and **20**, **20** and **22**, and **22** and **24**. The start photocells **42**, starting tree **44**, finish photocells **52**, and winner lights **54** are not necessary elements of the invention, but may be used in conjunction therewith.

Each racer **30** is controlled as its progresses along the track by means of a simulated gear shift mechanism **60** associated with each race lane **28** and **29**. The gear shift mechanism **60** includes shifting lever **62** mounted in a housing **64**. The interior end of the shifting lever **62** is attached to the floor of the housing **64** by means of a universal joint **66** so that the lever is free to be moved within the confines of the H-shaped gate **68** formed in the top of the housing. A gear shift knob **70** may be attached to the outer end of the shift lever. Springs **71** run from a collar carried on the gear shift lever **62** to the walls of the

housing 64 and serve to normally locate the lever in the neutral position in gate 68 as illustrated in FIGURE 4.

Each housing mechanism 60 simulates a 4-speed automotive transmission control. The shift lever 62 is moved within the gate 68 through various gear positions in order to control the progress of the racer 30 along the track. Normally open contact switches are located at the ends of the legs of the H-shaped gate 68 in each gear shift mechanism 60. As illustrated in the circuit diagram of FIGURE 3, switch 72 is located in the first gear position of the gate, switch 74 is located in the second gear position, switch 76 is located in the third gear position, and switch 78 is located in the fourth gear position. As shown in FIGURE 5 which is illustrative of any of the switches, the switch is closed by the gear shift lever 62 when it is moved to the outer end of the gate leg and forces contacts 79 together.

Each race lane 28 and 29 is provided with an electric circuit as shown in FIGURE 3 which connects the various contact strips of the lane with the gear shift mechanism used to control the progress of the racer along the lane. As illustrated in FIGURE 3, contact strip 14 is grounded and contact strips 18, 20, 22 and 24 are connected to one side of switches 72, 74, 76 and 78 respectively. The other side of each of these switches is connected to a voltage source 80. Contact strip 16 is connected to the voltage source 80 while contact strip 26 is grounded. An on-off switch 82 is provided for disconnecting the voltage source 80 from the circuit.

Each racer 30 is driven by an operator who controls the progress of the racer by means of the gear shift mechanism 60 associated with the lane 28 or 29 along which the raacer is driven. At the start of the race the on-off switch 82 in the control circuit is closed and the gear shift lever 62 is positioned in neutral and so that all of the switches 72, 74, 76 and 78 are open. When the green starting lights 48 are turned on, the operator moves the gear shift lever to the first gear position so that switch 72 is closed and a potential is established between contact strips 18 and 14. With the racer in the starting position and with the flexible contacts 34 and 36 in contact with the strips 18 and 14, the racer drive motor is energized and the racer moves down its lane toward the finish line.

When the front of the racer reaches the first indicator post 56 it is necessary to shift lever 62 from the first gear position to the second gear position in order to assure continued progress of the racer down the track, since the motor contact 36 passes from contact strip 18 to contact strip 20. If the shift of the lever 62 is made at the appropriate time, the contact strip 18 will be de-energized by the opening of switch 72 and the contact strip 20 will be energized by the closing of switch 74 as the racer passes the first indicator post 56, and the electric drive motor will continuously receive power. It should be noted that if the shift of the lever 62 from the first gear position to the second gear position is made too soon, the contact strip 18 will be prematurely disconnected from the voltage source and accordingly the racer will slow down. Likewise, if the shift from the first gear position to the second gear position is made too late, time is wasted since the racer will not receive power after contact 36 leaves strip 18 until the lever 62 is shifted so as to energize contact strip 20.

Likewise, when the racer approaches the second indicator post 56, which is located adjacent the junction between contact strips 20 and 22, the gear shift lever 62 must be shifted from the second gear position in which switch 74 is closed to the third gear position in which switch 76 is closed in order to energize contact strip 22. When the racer crosses the junction between contact strips 22 and 24, as indicated by the third indicator post 56, it is necessary to shift the lever 62 from the third gear position in which switch 76 is closed to the fourth gear position in which switch 78 is closed so as to energize contact strip 24.

As mentioned, the indicator posts 56 serve to locate the points along the track at which the various shifts must be made in order to race the racers 30 from the starting line to the finish line. In order to drive the racer from start to finish within a minimum elapsed time it is necessary that the shifts be made at exactly the time when the contact 36 of the racer is crossing the junction between the contact strips controlled by the switches in the shifting mechanism. A high degree of skill is required in order to shift the lever 62 through the gate 68 at the appropriate time in order to drive the racer 30 from the starting line to the finish line within a minimum time.

When the winning racer crosses the finish line, the appropriate finish photocell 52 is tripped and the winner light 54 adjacent the lane of the winning racer is turned on to indicate which of the cars 30 crossed the finish line first and won the drag race. The electric contacts 34 and 36 connect the racer driver motor to contact strips 16 and 26 located past the finish and provide a reverse voltage to the drive motor so as to slow the racer and prevent it from flying off the end of the race track. The racers are slowed to a stop and then may be driven backward to the starting line by a reverse voltage applied between the contact strips of each lane.

While the invention has been described in terms of a drag strip in which the shift lever is shifted from lower to higher gears, it is contemplated that the invention may be used on a closed track similar in layout to conventional slot racer tracks so as to control the progress of a slot racer therealong. In this case the track may have curves or hills which require the gear shift mechanism 60 to be shifted up and down through the various gear positions in order to drive the racer around the track within a minimum time. In this case there would be a number of contact strips located in an appropriate sequence around the track. In this case each switch may control a number of contact strips located along the track. Thus it will be seen that when the invention is used on a closed track as described, a number of up shifting or down shifting sequences will provide a degree of reality by requiring that the operators shift the gear shift mechanism correctly and at the proper time in order to control the progress of the racer around he track. In such case, indicating posts like post 56 may be provided with an appropriate color scheme so as to inform the players of the location and nature of the shift required.

It is also contemplated that the invention may be utilized with a circuit wherein the contact strips energized by the first speed switch 72 provide a small voltage for the drive motor, and the contact strips energized by the second, third and fourth speed switches 74, 76 and 78 respectively provide increasing voltage to the racer drive motor. In this way it is possible to increase the reality of the race since the speed of the racer is determined by the position of the gear shift lever 62. It is possible to achieve this result by placing resistors of decreasing value in the leads connecting switches 72, 74 and 76 to the contact strips controlled thereby. There is no need to place a resistor in the lead from switch 78 to the contact strips controlled by said switch since in fourth speed the racer is going as fast as possible. Also, it may be desirable to control the voltage between the contact strips in each racing lane by providing a rheostat controlled accelerator pedal for each driver. The rheostat may be connected between the voltage source and the contact switches 72, 74, 76 and 78. In this way the driver can control the voltage received by the racer by means of the accelerator pedal.

While the use of a simulated gear shift mechanism 60 to control the progress of the racer along the track adds a degree of authenticity to the invention, the invention is not limited to the use of such a device. For example, an inexpensive form of the invention might utilize man-

ually actuated push button switches which are depressed as the racer moves down the track.

What we claim as our invention is:

1. In a drag strip for slot racers, a track having a pair of racing lanes thereon each comprising a slot for guiding a slot racer along the track, a series of elongated contact strips disposed in end-to-end relation along one side of said slot, a continuous contact strip extending along the other side of said slot, a series of electrical switches, a first electrical circuit between each of said individual contact strips and said continuous contact strip with each switch positioned in said circuit between one of said individual contact strips and said continuous contact strip, operator controlled means for selectively closing said switches, two elongated brake contact strips located to either side of said slot at one end of said track with one brake contact strip in end-to-end relation with said individual contact strips and the other brake contact strip in end-to-end relation with said continuous contact strip, a second electrical circuit between said elongated brake contact strips, and a DC voltage source

arranged in both of said circuits to provide a first voltage between said individual contact strips and said continuous contact strip and a second voltage between said one brake contact strip and said other brake contact strip, the polarity of said first voltage being opposite the polarity of said second voltage.

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