

- [54] **APPARATUS FOR SIMULATING CROSSROADS VEHICULAR TRAFFIC**
[76] Inventor: **Richard L. Brown**, 1812 Pelton Ave., Bellevue, Nebr. 68005
[22] Filed: **Oct. 2, 1972**
[21] Appl. No.: **294,381**
[52] U.S. Cl. **273/86 R**
[51] Int. Cl. **A63f 9/14**
[58] Field of Search 273/1 E, 86 R, 86 B, 101.2, 273/85 R; 35/11; 46/202

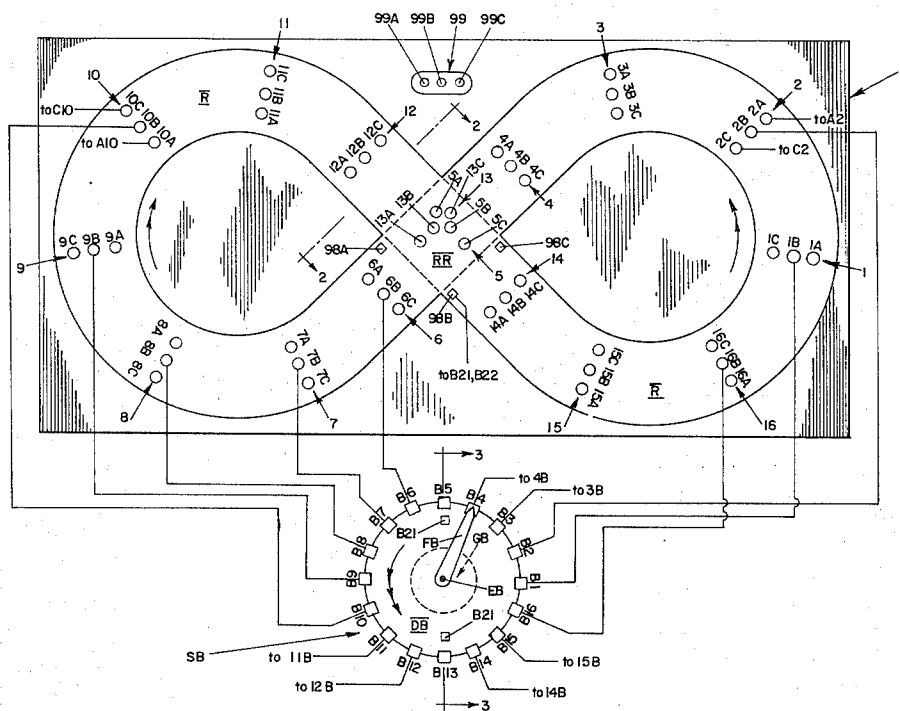
Primary Examiner—Anton O. Oechsle
Attorney, Agent, or Firm—George R. Nimmer

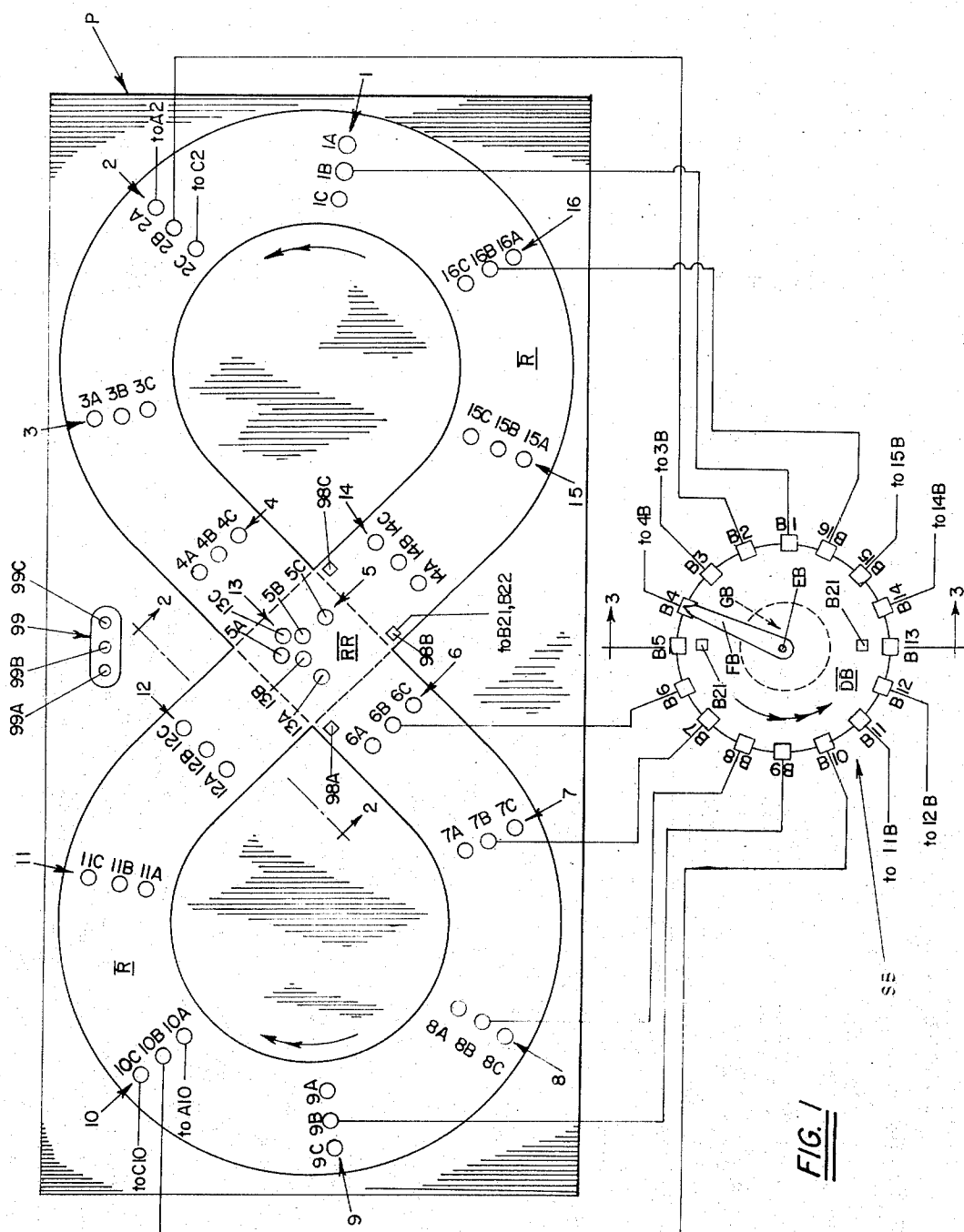
[57] **ABSTRACT**

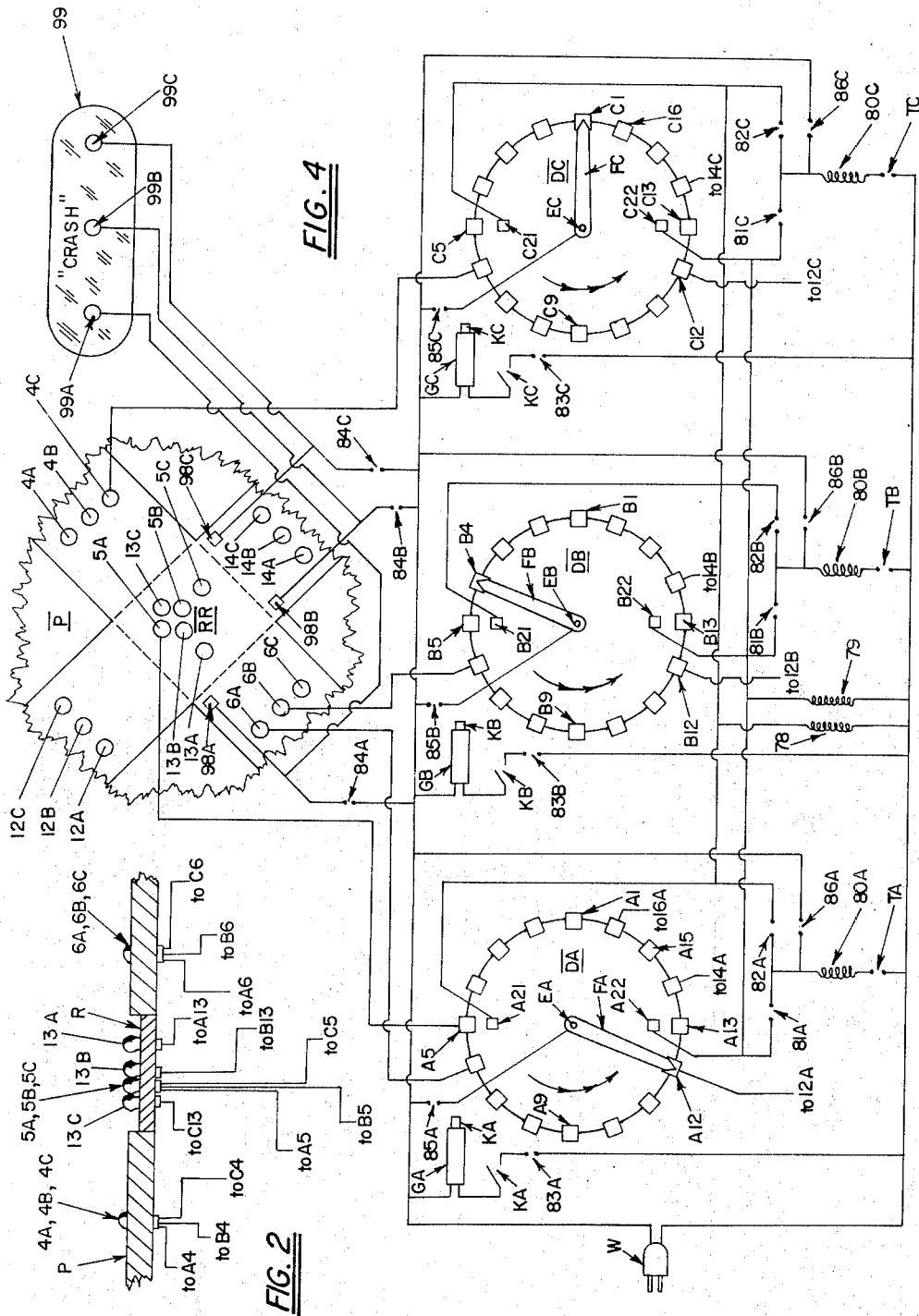
There is provided amusement apparatus having some roadway system layout including at least two cross-wise intersecting roadway segments that together define one or more roadway crossroads portion, there being a plurality of simulated vehicles movably traveling along the roadway and merging towards the crossroads and preferably from cross-wise directions whereby the potential for vehicular collision exists thereat, speed variation means assigned to individual simulated vehicles and manipulatable remotely from the roadway whereby the operator assigned to an individual vehicle can control its ability to negotiate crossroads traffic, collision-indication means to apprise an operator whenever his assigned vehicle and another have substantially simultaneously merged at the crossroads, and means for allowing apparent collision victims to survive and thereafter travel along the roadway.

11 Claims, 5 Drawing Figures

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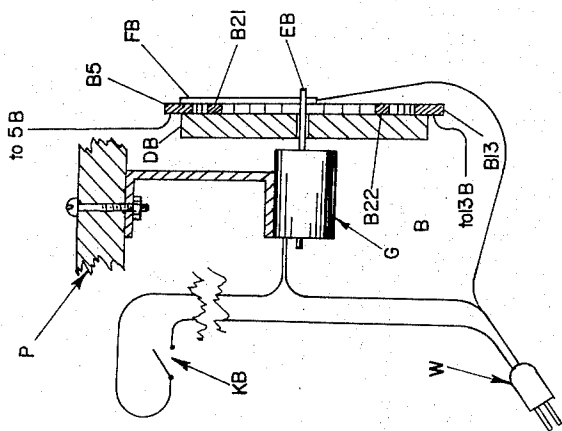


FIG. 3

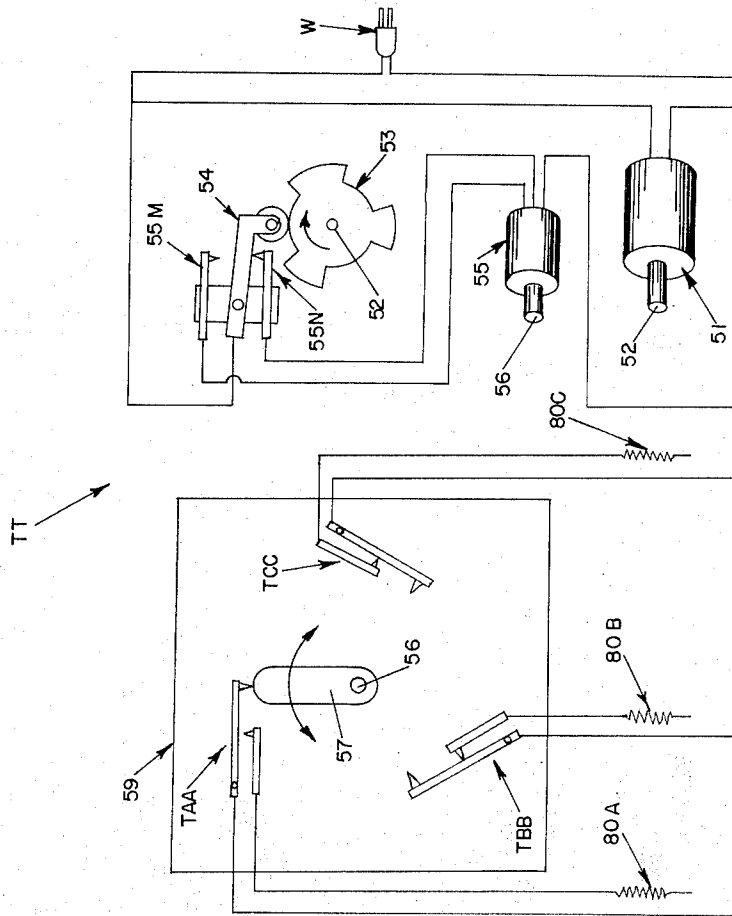


FIG. 5

APPARATUS FOR SIMULATING CROSSROADS VEHICULAR TRAFFIC

SPECIFICATION

A roadway crossroads exists whenever two or more roadway segments intersect cross-wise, and crossroads collision for automobiles and similar surface vehicles is possible thereat. A common type crossroads is where two or more roadway segments intersect in crosswise fashion at the same elevation; the intersecting roadway segments (through their respective transverse widths) together define a crossroads of finite intersectional area. Especial hazard is offered whenever two traveling vehicles simultaneously arrive into the crossroads from cross-wise directions. For safety reasons, the typical driver of automobiles, railway trains, and other surface vehicles, necessarily cautiously approaches a crossroads intersection of two roadway segments. Nevertheless, crossroads collisions do occur, oftentimes because a vehicle driver does not have the physical ability to react or otherwise properly negotiate the traffic (and particularly the cross-traffic), and othertimes because the driver psychologically yearns for a thrilling experience. Indeed, there are racetracks where spectators can watch daring professional drivers race their vehicles for several laps around a surface raceway replete with cross-traffic intersections. A typical, (though not limiting) example of such raceways are those comprising a closed loop pathway of twisted-loop configuration (the so-called "FIG.-8") having a single cross-wise intersection that needs to be crossed twice per lap by a vehicle in its quest to win.

Prior art workers have attempted to provide apparatus for simulating roadway vehicular driving through crossroads utilizing remotely controlled miniature vehicles, thus ostensibly permitting the operator's driving skill and judgement to be tested. However, such prior art apparatus have not been successful in presenting sufficiently realistic and challenging crossroads traffic conditions to the operator. Moreover, the remotely controlled simulated vehicles upon collision (and especially from cross-traffic) tend to become damaged or incapable of further travel, requiring operator intervention at the crossroads for vehicular repair or rehabilitation.

It is accordingly the general object of the present invention to provide apparatus that will simulate in miniature roadway crossroads driving conditions whereby the apparatus operator can vicariously and fairly realistically participate in the problems and experiences associated with the actual driving of vehicles through roadway intersections, and even including cross-traffic.

It is another object to provide apparatus that can be employed to test and evaluate the operator's ability to control an automobile or other self-propelled surface vehicle under typically encountered conditions of roadway intersections.

It is a further object to provide apparatus utilizing a miniature roadway system layout and simulated vehicles seemingly traveling therealong, wherein the conditions offered thereby closely approximate actual driving conditions and problems attendant with crossroads of intersecting roadway segments.

It is yet another object to provide unusually realistic and exhilarating simulated cross-traffic conditions in

miniature to the apparatus operator whereby he can readily imagine himself driving an automobile or other vehicle at high speeds thereby testing his skill at negotiating vehicular cross-traffic. It is an important ancillary object to realistically simulate certain effects of actual intersectional roadway collisions upon merging vehicles, yet without more than a brief interruption of roadway travel for a collision victim.

It is a further object to provide an apparatus simulating in miniature typical raceway situations comprising a roadway with segments intersecting in cross-wise fashion whereby a remotely controlled participant vehicle in its quest to win the race must negotiate cross-traffic while judiciously maintaining a high rate of speed. It is an important object to penalize vehicle participants whenever involved in cross-traffic collision, yet without permanently disabling the vehicle from thereafter continuing in the same race.

It is yet another object to provide amusement apparatus of the so-called coin-operated type suitable for public installation and use, wherein two, three, or even more operators respectively assigned to a like number of simulated vehicles might participate and compete in a realistic racetrack type race.

With the above and other objects and advantages in view, which will become more apparent as this description proceeds, the apparatus for simulating crossroads vehicular traffic generally comprises: a miniature roadway system or layout including at least two intersecting roadway segments to provide a roadway crossroads portion; a plurality of simulated vehicles apparently movable along the roadway and individual vehicles being mergeable at the crossroads; remotely controllable speed variation means assigned to individual simulated vehicles and effectively exercisable as the individual vehicle approaches the crossroads whereby the remotely located operator might determine his assigned vehicle's ability to negotiate potential simulated vehicular traffic thereat; collision-indication means to apprise an operator whenever his assigned vehicle and another vehicle have substantially simultaneously arrived at the same roadway crossroads; and apparatus survival means to ensure that a vehicle victim of crossroads collision is not more than temporarily thwarted from roadway travel movement.

In the drawing, wherein like characters refer to like parts in the several views, and in which:

FIG. 1 is a top plan view of a representative embodiment of the apparatus for simulating crossroads vehicular traffic of the present invention. Because of space limitations, only a portion of the representative speed variation and collision-indication means is shown.

FIG. 2 is a sectional elevational view taken along line 2—2 of FIG. 1.

FIG. 3 is a sectional elevational view taken along line 3—3 of FIG. 1.

FIG. 4 is a circuit diagram showing the speed variation, the collision-indication, and the survival means for the FIG. 1 representative embodiment.

FIG. 5 is a schematic diagram showing a vehicle survival means of a preferred time delay type.

It is a general concept of this invention to provide crossroads vehicular traffic amusement apparatus comprising simulated vehicles seemingly traveling along cross-wise intersecting roadway segments whereby the possibility for vehicular collisions exists. The overall roadway system suitable for this general concept might

be selected from a variety of crosswise intersecting patterns. For example, there might be two independent roadway segments with the simulated vehicles being arbitrarily divided into two groups, each group being restricted to travel along one segment. Illustrating this possibility would be two finite-length roadway segments intersecting cross-wise, the two vehicular groups reciprocating bi-directionally along their respective roadway segments. Similarly illustrative would be two or more independent closed loop roadway segments intersecting cross-wise, the groups of simulated vehicles traveling (either uni-directionally or bi-directionally) along their own respective annular roadway segments. Instead of plural independent roadway segments with vehicular groups restricted to one segment, the roadway system pattern might comprise a single twisted-loop continuous pathway, e.g., 8-shaped, the crossover point(s) of which provide the cross-roads. In this regard, all simulated vehicles might occupy the same twisted-loop pathway, each traveling uni-directionally or bi-directionally therealong.

FIGS. 1-3 might serve to explain the general concept of the cross-roads vehicular cross-traffic amusement apparatus, particularly in regards to vehicular travel along the roadway and vehicular interplay at the roadway crossroads. This general explanation need not necessitate an exhaustive treatment of mechanism, which might await a detailed treatment in FIGS. 4-5. For the representative embodiment of FIGS. 1-5, the roadway system "R" selected therefor is of the single twisted-loop pattern, e.g., 8-shaped. As the framework for the uniplanar roadway R, there might be a rectangular planar panel P that is readily supportable horizontally (as on a floor or table) or vertically (as upon a wall). Herein, the panel P is provided with a constant-width 8-shaped groove to provide roadway R, the crossroads intersectional area RR being square as indicated in broken line. While any convenient plural number of simulated vehicles might be selected for movement along the raceway R, three vehicles (A, B, and C) are herein arbitrarily employed. Herein, each vehicle is arbitrarily made to be movable uni-directionally along R and all in the single pathwise direction indicated in double-headed arrow. A plurality of serially individually illuminatable incandescent bulbs, (each bulb having a fixed roadway-position along panel P and roadway R) is herein employed to provide each simulated vehicle. For example, sixteen incandescent bulbs having a suffix-A and serially numbered from 1A to 16A provide sixteen roadway-positions for simulated vehicle A. Similarly, sixteen light bulbs having a suffix-B and serially numbered from 1B to 16B provide sixteen roadway-positions for vehicle B; and sixteen light bulbs with suffix-C serially numbered from 1C to 16C provide sixteen roadway-portions for vehicle C.

Whenever the sixteen stationary light bulbs allotted to some one simulated vehicle are briefly singly sequentially actuated in numerical order, then there is the optical impression that the vehicle is traveling along the roadway R. For example, sequential illumination of bulbs 1A, 2A, . . . 16A, 1A, etc., would create the optical impression of vehicle A traveling several laps of the 8-shaped twisted-loop racecourse R in the double-headed arrow direction of FIG. 1. If all three sets of 16 light bulbs are similarly sequentially briefly actuated, then there is the optical impression that vehicles B and C too are simultaneously racing with vehicle A repeat-

edly along roadway R. The sequential illumination means alluded to in FIGS. 1 and 3 comprises a stepper unit S for each sixteen bulbs set, such as similar units SA, SB, and SC for vehicles A, B, and C, respectively. Typical stepper unit "SB" comprises an electrically-insulated circular plate DB, there being sixteen electrically-conductive isolated primary-stations B1, B2 . . . B16 carried at equal angular spacing along the circumference of DB. Station B1 is electrically connected to light 1B, station B2 is electrically connected to light 2B, etc., and finally station B16 is electrically connected to light 16B. A rotatable central shaft EB passes centrally through plate DB; extending radially from shaft EB and co-rotatable therewith is electrically-conductive sweep-arm FB. Thus, as shaft EB is powerably rotated, as through gear motor GB, arm FB is made to travel in the tri-headed arrow direction of FIG. 1 and to contact isolated primary-stations B1, B2, etc., in stepwise fashion. As will be apparent from FIG. 4, electrical power W for illuminating the light bulbs 1B-16B necessarily passes radially along arm FB, thereby ensuring sequential illumination. It can be readily appreciated that stepper units SA and SC are structurally and functionally analogous to SB and can create the impression of two more simulated vehicles (A and C) traveling around roadway R.

The 8-shaped roadway R seemingly provides an endless twisted-loop raceway when a vehicle travels uni-directionally for several laps therealong; yet, FIG. 1 reveals that roadway R might be arbitrarily divided into two cross-wise intersecting S-shaped segments. One S-shaped roadway segment extends substantially from roadway-positions 1-8, with the other segment extending substantially from vehicular positions 9-16; both segments include crossroads RR. Light bulbs 5A, 5B, 5C, 13A, 13B, and 13C are all located within crossroads RR. For this reason the stepper areas A5, A13, B5, B13, C5, and C13 are called collision primary-stations. It can readily be appreciated that, by virtue of steppers SA, SB, and SC, individual vehicles occupying different roadway segments might happen to be on a collision course merging toward crossroads RR. For example, vehicles B and A might be momentarily at roadway-positions 4 and 12, respectively, and both only one roadway-position from merging at crossroads RR, within which area the simulated vehicles collision might be defined to occur. When said stepper units SA and SB are employed to motivate the vehicles A and B, and assuming that each vehicle attains roadway positions in ascending numerical order, then a collision is defined to result when the arms FA and FB are at stepper collision stations A13 and B5, respectively. When this happens, lights 5B and 13A would be illuminated substantially simultaneously to provide one type of collision-indication means. However, the vehicular merger at crossroads R is transitory toward roadway-positions 6B and 14A, i.e., collision victims would continue traveling about roadway R as the stepper arm F continues moving. Thus, there is provided one type of vehicle survival means to allow subsequent travel for the collision victims even though the operator remains located remote of the crossroads at his own switch K.

It will at this juncture be readily apparent that the general concept of amusement apparatus for simulating crossroads-vehicular traffic is readily adaptable for the playing situations wherein there is one or more opera-

tor contestants positioned remotely from the apparatus raceway. There might be a vehicle assigned to an operator who in order to accomplish scoring for himself either seeks or avoids collisions with other vehicles, according to the prescribed game rules. In this vein, there are speed variation means assigned to individual simulated vehicles and controllable from an operator's station located remote from the roadway crossroads area whereby the operator can determine his own vehicle's ability to negotiate crossroads traffic. The speed variation means might taken any one of several forms. For example, assuming that the stepper units S are located remote from crossroads RR and equipped with a hand-crank (not shown, and in lieu of motor G) for manually revolving shaft E and arm F, then any operator can wholly manually provide the vehicle speed variation means for his assigned vehicle. If, instead, it is desired to automatically power the stepper shaft E and arm F, as with a constant speed gear motor G, then there might be a manually actuatable switch K located remote of crossroads RR and interposed between the electrical energy source W and the gear motor G. For example, the operator assigned to vehicle "B" could actuate the normally-closed switch KB to open just as vehicle B were approaching the crossroads area RR. This would stop gear motor G and arm FB thereby stopping vehicle B before reaching crossroads RR to avoid collision with vehicular traffic thereat.

The description thus far (FIGS. 1-3) has disclosed a rudimentary yet operable embodiment of the amusement apparatus for simulating crossroads vehicular traffic. For example, there might be three remotely stationed operators respectively assigned to vehicles A (from normally-closed switch KA), B (from switch KB), and C (from switch KC). The contest rules might arbitrarily provide that the first operator whose assigned vehicle travels a prescribed number of laps (e.g., ten laps) of closed-loop roadway R wins the race, except that any vehicle suffering a prescribed number, (e.g., five) of crossroads collisions is disqualified from winning. A human referee armed with pencil and paper might be employed to record for each vehicle the number of roadway laps traveled and the apparent vehicular crossroads collisions suffered and to ultimately orally declare the race winner. However, there might be means to automatically record the number of roadway laps traveled by each vehicle, such as a conventional revolution counter applied to the respective stepper unit arms F, thereby leaving for the human referee the sole duty of recording crossroads vehicular collisions.

As indicated in FIG. 4, the rudimentary apparatus embodiment of FIGS. 1-3 might be refined in the aspects of the collision-indication means and of the collision victim survival means, thereby making the vehicle race contest more realistic and interesting to the spectators. For example, following an apparent crossroads traffic collision between two vehicles, the collision-indication means might be made to be more spectacular than just the mere visual confluence or merger of collision victims at the roadway crossroads area. For example, the collision-indication means might further include: automated indication of vehicular collisions, interruption of roadway vehicular traffic for a collision victim, apparent crashing at a roadway wayside-station, etc. Assuming the use of sequentially illuminated bulbs as each simulated vehicle with its roadway-stations

being controlled by respective stepper units S. Then, as further exemplified by FIGS. 1-4, for a cross-traffic type vehicular collision, two collision primary-stations (of the five-suffix and also of the 13-suffix) of different stepper units S will need to be substantially simultaneously contacted by their respective sweeper-arms F. In this vein, there are desirably means for sensing when the respective sweeper-arms F are together defining a cross-traffic collision situation. For example, a first relaycoil 78 might sense when a sweeper-arm F is aligned with a five-suffix primary-station, and second relaycoil 79 might sense when the sweeper-arm F of another stepper unit is aligned with a 13-suffix primary-station. Herein, each stepper unit S is also provided with a pair of distinct secondary-stations structurally analogous to the several primary-stations, but radially aligned with and arcuately shorter than the two collision primary-stations. For example, plate DB of stepper unit SB between one collision primary-station B5 and shaft EB and again between the other collision primary-station B13 and EB carries secondary-stations B21 and B22, respectively. Similarly, plate DA of stepper unit SA carries secondary-stations A21 (aligned with collision primary-station A5) and A22 (aligned with A13); also, plate DC of stepper unit SC has similarly diametrically aligned secondary-stations C21 and C22.

As seen in FIG. 4, for each stepper unit S there is a relay coil (80A, 80B, 80C) which when energized initiates appropriate automated collision-indication means for its own assigned vehicle. In this embodiment, the relay coil 80 assigned to a vehicle can be energized only when it is apparently involved in cross-traffic collision, during which occurrence the sweeper-arms F of the steppers S corresponding to the collision victims are contacting five-suffix and 13-suffix primary-stations, respectively. When this happens, the electrically-conductive sweeper-arms F can also be contacting the 21-suffix and the 22-suffix secondary-stations, respectively, and a relaycoil 78 and 79 would be energized. For each stepper unit S there are two electrically parallel lines (including for each line a normally-open switch closeable by a relaycoil 78 or 79) extending from the respective stepper secondary-stations to the stepper relay coil 80. Specifically, for stepper SA there are parallel normally-open switches 81A and 82A; for stepper SB there are similar parallel switches 81B and 82B; and for stepper SC there are analogous switches 81C and 82C. For any stepper unit S, its own normally-open switches 81 and 82 are closeable by energization of relaycoils 78 and 79, respectively. Thus, energization of a relay coil 80 for any stepper unit S can happen only during cross-traffic vehicular collision and at which time relaycoils 78 and 79 are simultaneously energized, i.e., sweeper-arms F of the involved steppers S are contacting the 21-suffix and the 22-suffix secondary-stations, respectively.

An arbitrarily selected situation might now be illustrated wherein two vehicles are in aforesaid cross-traffic collision with their respective relay coils 80 being substantially simultaneously energized to automatically initiate selected collision-indication means. It might be supposed that sweeper-arms FA and FB are both moving counterclockwise through gear motors G at substantially identical angular velocities with FA having just arrived at stations A13 and A22. Accordingly, roadway-station 13A becomes illuminated indicating that vehicle A has just arrived into the cross-

roads RR. Relaycoil 79 is thus energized which closes the normally-open switches 82A, 82B, and 82C. As the counterclockwise moving sweep-arm FA yet remains in contact with stations A13 and A22, sweep-arm FB might be just arriving at stations B5 and B21, this indicating that vehicles A and B are both simultaneously occupying crossroads RR. Relaycoil 78 is thus also energized which closes switches 81A, 81B, and 81C. Accordingly, relay coils 80A and 80B have both become energized inasmuch as their switches 81 and 82 have been made closed. The energized relay coils 80A and 80B are capable of opening the normally-closed switches 83A and 83B, respectively, which stops gear motors GA and GB, respectively. Simultaneously, sweep-arms FA and FB are stopped at stepper primary-stations A13 and B5, respectively. Assuming in this paragraph only that switches 84, 85 and 86 are eliminated from the FIG. 4 circuitry, then the collision-indication means is automatically indicated merely as a cessation of vehicle travel movements within the crossroads area RR; i.e., collision victim A remains stopped at illuminated roadway-position 13A and victim B remains stopped at illuminated roadway-position 5B. It might be desired to attach to panel P a translucent signboard 99 carrying the indicia "CRASH" and having positioned therewithin light bulbs 99A, 99B, and 99C, which bulbs are respectively connected to the steppers SA, SB, and SC. There is interposed between the respective relay coils 80 and the ground circuit appropriately normally-closed time delay devices T, individually distinguished suffixially such as TA, TB, and TC. The time delay device T might be of several permitted forms, such as: a thermal time delay switch; a mechanical timer; the random time delay assembly TT of FIG. 5, etc. In any case, the normally-closed time delay device T needs to be made open before relay coils 80 can become de-energized so as to function as vehicle survival means e.g., allowing the gear motors G to re-start whereby the collision victim vehicles can automatically resume roadway travel.

Rather than a mere cessation of vehicular travel within the crossroads area RR for the collision victims, the collision-indication means might be dramatized to indicated a wayside-station sojourn for collision victims. In this vein, panel P carries light bulbs 98A, 98B, and 98C assigned to the respective vehicles (A, B, C). These three wayside-station bulbs 98A, 98B, and 98C are connected to the ground circuit through normally-open switches 84A, 84B, and 84C, respectively, which can be made closed by the respective delay coils 80. Interposed between the several sweep-arms F and the ground circuit are normally-closed switches 85A, 85B and 85C. Finally, interposed between the respective relay coils 80 and the ground circuit are normally-open switches 86A, 86B, and 86C. Reassuming that the counterclockwise moving sweep-arms FA and FB are at secondary-stations A22 and B21, respectively, then relay coils 80A and 80B will through switches 84A and 85A illuminate wayside-stations 98A and 98B. Concurrently, energized relay coils 80A and 80B will through the switches 85A and 85B de-activate bulbs 13A and 5B so long as bulbs 98A and 98B remain illuminated; this allows other vehicles, (e.g. C) to pass unobstructedly through the crossroads RR. Switches 86A and 86B maintain relay coils 80A and 80B in an energized state during the time period when switches 85A and 85B are

being held open, but only until intervention of the time delay means T.

The time delay device "T" assigned to each of the vehicles (through its own stepper unit) might afford some definite time interval sojourn for a collision victim at its wayside-station 98. In this way, during a multi-laps race any one of the moving vehicles would be penalized the same time period for each crossroads collision it suffers. However, the apparatus might provide a more interesting race among several remotely positioned operators if their respective vehicles, whenever involved as a collision victim, has a seemingly random time sojourn at a wayside-station. The time delay assembly TT (which includes therewithin three of said normally-closed time delay devices T) affords such randomness, thereby interjecting an element of luck or chance into an apparatus roadway race. As seen in FIG. 5, the random time delay apparatus TT includes a cam 53 that is centrally powerably rotated in a single angular direction, (e.g., herein clockwise), by a motor 51 having a revolving shaft 52. Herein, motor 51 is of the constant speed type, (e.g. 10 rpm), powered from said electrical source W. The circumferential portion of cam 53 is nearly wholly defined by two constant radii from its center 52. There is a second motor 55 having two sets of electrical windings (herein indicated at motor winding leads 55M and 55N) whereby its revolving shaft 56 is selectably rotatable in both angular directions at some appropriate angular velocity, (e.g., 30 rpm). A cam-follower 54 for cam 53 and positioned between the stationary motor leads 55M and 55N, but is capable of (in) electrically-conductive contact with the leads singly. Thus, the frequency and duration of each angular directional movement for shaft 56 depends upon the proportion of the two respective radii arbitrarily designed into the cam 53 circumferential contour. Shaft 56 passes centrally through a backing-plate 59 and carries a radial-arm 57. Also mounted to backing-plate 59 and located constant radial distances from shaft 59 are three normally-closed switches TAA, TBB, and TCC (herein 120° apart). Each of the three normally-closed switches is adapted to be contacted (and thereby made open) by rotating radial-arm 57, such as typified at position TAA in FIG. 5. The seemingly random opening of these three normally-closed switches will cause de-energization of the relay coil 80 assigned to it, thereby furnishing seemingly random sojourns at the respective way-side stations 98 for collision victims.

Operation of the representative embodiment (FIGS. 1-5) for the apparatus for simulating crossroads vehicular traffic and collisions has already been alluded to. However, a general summation thereof follows, certain convenient (though non-limiting) assumptions being arbitrarily made for a typical operational situation. It might be arbitrarily assumed that the panel "P" is attached to an upright wall of a gameroom that is occupied by several persons, whereby the miniature roadway R (and including crossroads RR) is in full view of the operators and spectators. Because the apparatus embodiment depicted has three simulated vehicles (although further vehicles D, E, etc., could be readily built thereinto), there is permitted up to three operator-contestants for a multi-laps vehicle race around roadway R. To aid in explanation, the three operating persons might be personified as Abe, Bill, and Cal, who have chosen to identify themselves with vehicles A, B, and C, respectively. Each of the three operators is af-

forded with his own independently manipulatable switch K located within the gameroom remote of panel P, e.g., Abe at switch KA, Bill at KB, and Cal at KC. A human referee might be employed for initiating the race by inserting plug W into an electrical outlet and also for counting the number of roadway laps traveled by each simulated vehicle (although as previously alluded to both tasks could be performed by mechanical addenda). For the purpose of ready discernment among the respective vehicles by operators and spectators, the several light bulbs corresponding to some one vehicle are made visually distinct from the other arrayed bulbs, as through numbering or color codes, etc.

Arbitrarily further assuming that it is desired that all vehicles (through their stepper arms F angular direction) travel in the same pathwise direction around roadway R and that all vehicles (as through motors G of comparable speed) be of substantially constant roadway velocity from one roadway-position to the other. Then, for a finite multi-laps race around the raceway R, the operator whose assigned vehicle wins the race is likely to be the one who is the best (through manipulation of his own switch K) at negotiating cross-traffic at the crossroads RR. It behooves that operator whose vehicle is ahead of the others in the multi-laps race to avoid cross-traffic vehicular collisions; however, he will likely fall behind (and perhaps lose his lead) if he uses switch K too often. By virtue of the seemingly random time sojourn at the wayside-stations for the collision victims, it might sometimes be advantageous for the operator of a lagging vehicle to actively seek a cross-traffic collision. For example, Abe's vehicle A might have progressed to a half-lap lead over Bill's vehicle B. Thus, Bill might judiciously decide to actively seek (through time manipulation of his switch KB) a cross-traffic collision with vehicle A. The reason for this maneuver is that Bill hopes that the random time assembly TT will be at a mechanical stage to rehabilitate his vehicle B from its wayside-station 98B quicker than for vehicle A from 98A, the time differential being hopefully sufficient for Bill to regain a half-lap, or more. With the apparatus circuitry shown, during these sojourns of victims A and B, Cal's vehicle C is immune from colliding with them.

From the foregoing, the construction and operation of the apparatus for simulating vehicular cross-traffic and other crossroads type collisions will be readily understood and further explanation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those having ordinary skill in the art, it is not desired to limit the invention to the exact embodiment shown and described, and accordingly, all suitable equivalents might be resorted to and falling within the scope of the appended claims.

I claim:

1. Apparatus for simulating crossroads vehicular traffic including potential collisions thereat, said apparatus comprising:

- A. A roadway system layout including cross-wise intersecting roadway segments that provide at least one roadway crossroads portion;
- B. A plurality of simulated vehicles apparently movable along the roadway, individual vehicles being adapted to occupy different roadway segments and movable toward the dual-segments crosswise inter-

section whereby simulated vehicular cross-traffic and collision potential are afforded thereat;

C. Speed variation means assigned to individual simulated vehicles and manipulatable from an operator's station located remote from the roadway crossroads, said speed variation means being effectively exercisable by the operator as the individual vehicle approaches the crossroads whereby the operator assigned thereto might control his own vehicle's ability to negotiate the potential simulated vehicular cross-traffic;

D. Collision-indication means to apprise an operator whenever his own assigned vehicle and another vehicle have substantially simultaneously arrived at the same roadway crossroads whereby the vehicles have seemingly merged to become collision victims, said collision-indication means being exhibited as an apparent interruption of roadway travel movement for a crossroads collision victim; and

E. Collision victim survival means as a portion of the apparatus to automatically restore vehicular travel movement capability of a crossroads collision victim by virtue of an automatic time delay device after the collision-indication means has indicated that vehicles have apparently been engaged in vehicular collision.

2. The apparatus of claim 1 wherein each of said plurality of simulated vehicles comprises a plurality of incandescent bulbs having stationary roadway-positions, each said plural bulbs array simulated vehicle being singly sequentially illuminatable through its own stepper unit which has a movable sweeper-arm; and wherein the speed variation means includes means for altering the angular velocity of a stepper sweeper-arm.

3. The apparatus of claim 1 wherein the plurality of simulated movable vehicles is at least three in number; and wherein there are speed variation means assigned to at least two different simulated vehicles, the speed of individual vehicles when approaching the crossroads being controllable independently from remotely located operator stations which are also distinctly separated from each other.

4. The apparatus of claim 1 wherein the collision-indication means is exhibited by apparent movement cessation of a vehicle collision victim at a roadway wayside-station located adjacent to the roadway crossroads; and wherein there are collision-isolation means to permit simulated vehicles arriving at the crossroads to travel uninterruptedly therethrough even during that time period when one or more collision victims are temporarily stopped at said wayside-stations.

5. The apparatus of claim 4 wherein there is a plurality of wayside-stations for use by respective collision victims; and wherein the survival means time delay device is capable of furnishing a time differential among collision victims for their sojourn at respective wayside-stations.

6. The apparatus of claim 1 wherein the roadway system layout includes at least one closed loop pathway portion for vehicular movement along the entire closed loop.

7. The apparatus of claim 6 wherein a crossroads is provided from a single closed loop pathway of twisted-loop configuration.

8. The apparatus of claim 7 wherein the plurality of simulated vehicles is at least three in number; wherein there are independent speed control means assigned to

at least two different simulated vehicles, the speed of individual vehicles being controllable from remotely located operator stations which are also distinctly separated from each other; wherein the collision-indication means is exhibited as an apparent movement cessation of a vehicle collision victim at a wayside-station located adjacent the crossroads; wherein the survival means includes means for automatically restoring vehicular travel capability along the roadway after a collision victim has had a sojourn at a said wayside-station; and wherein there are collision-isolation means to permit simulated vehicles arriving at the crossroads to travel uninterruptedly therethrough even during the time period when one or more collision victims are temporarily stopped at a said wayside-station; and wherein the average maximum travel speed capability of the several vehicles is generally comparable so as not to vary by not more than about 10 percent.

9. Apparatus for simulating crossroads vehicular traffic and collisions, said apparatus comprising:

- A. A roadway system layout including cross-wise intersecting roadway segments that provide at least one roadway crossroads portion;
- B. A plurality of simulated vehicles movable along the roadway and being adapted to substantially simultaneously occupy the same crossroads portion of the roadway system;
- C. Speed variation means assigned to individual simulated vehicles and manipulatable from an opera-

tor's station located remote from the roadway crossroads, said speed variation means being effectively exercisable by the operator as the individual movable vehicle approaches said crossroads;

D. Collision-indication means to apprise a said remotely located operator that a plurality of simulated vehicles have substantially simultaneously arrived at some one crossroads to have seemingly become collision victims, said collision-indication means being exhibited as an apparent interruption of roadway travel movement for a collision victim; and

E. Survival means as a portion of the apparatus to ensure vehicular travel movement for the crossroads collision victims after the collision-indication means has indicated an interruption of their roadway travel movement, said survival means including means for automatically restoring vehicular travel capability through a time delay device.

10. The apparatus of claim 9 wherein the roadway system layout includes at least one closed loop pathway portion of twisted-loop configuration.

11. The apparatus of claim 10 wherein each of said plurality of simulated vehicles comprises a plurality of incandescent bulbs located at stationary roadway-stations, each of said plural bulbs array being singly sequentially illuminatable and differing in color from that of other arrayed bulbs simulated vehicles.

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