TIMING APPARATUS FOR TOY RACING CARS

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ABSTRACT
A timing apparatus for use as an accessory with toy racing cars or the like to time a car as it travels from a starting point to a second point. The apparatus includes a frame and a timer mounted on the frame, the timer having a visual clock indicator. An actuating mechanism is operatively connected with the timer and includes a time delay device to actuate the timer a predetermined time after conditioning the actuating mechanism to permit an operator of a car to condition the actuating mechanism and then move to his respective car at the starting point before the timer is actuated. A gate member is operatively associated with the timer to automatically stop the timer when a car reaches the gate. A visual indicating device is associated with the time delay device to indicate the time progression of the time delay device so that an operator of a car can observe the time within which he must ready his car for operation.

18 Claims, 6 Drawing Figures
TIMING APPARATUS FOR TOY RACING CARS

BACKGROUND AND SUMMARY OF THE INVENTION

There presently is on the market a wide variety of toy racing cars designed for the entertainment of children, in particular, and to enhance their dexterity and ingenuity. Many of such toy racing cars travel at surprisingly fast speeds. The cars may travel over a given route such as a designed track, or the like, or the cars simply may be designed to travel at a relatively high rate of speed from a starting point to a given or arbitrary finishing point so as to instill competition between the individuals who operate the cars. Various accessories are available for use with such toy racing cars to enhance the utility thereof. The present invention is directed to providing a new accessory for such use.

A principal object, therefore, of the present invention is to provide a novel accessory for use with toy racing cars or the like.

Another object of the invention is to provide a timing apparatus for use with toy racing cars or the like.

A further object of the invention is to provide a timing apparatus for use with toy racing cars or the like to time the racing car as it travels from a starting point to a second or "finishing" point. The timing apparatus includes a frame, a timer mounted on the frame and having a visual clock indicator, actuating means operatively connected with the timer and including time delay means to actuate the timer a predetermined time after conditioning the actuating means to permit an operator of a car to condition the actuating means and then move to his respective car at the starting point before the timer itself is actuated. Means are provided to stop the timer automatically when a car reaches the second or finishing point.

Still another object of the invention is to provide a timing apparatus of the character described which incorporates means for indicating the time progression of the time delay means. The indicating means preferably comprises a plurality of visual indicating devices arranged in a series on the frame of the apparatus, with means to effectively energize the indicating devices seriatim during the time period of the time delay means. In the preferred embodiment of the invention, the indicating devices comprise electric light means. The frame has a generally hollow portion with a plurality of apertures arranged vertically in a series, and the electric light means comprises an electric lamp mounted within the generally hollow frame for movement seriatim behind the apertures. The last of the apertures in the series may be designed to give off a green colored light when the lamp is positioned therebehind to indicate to the operator or operators of the cars when the timer has started.

The apparatus includes a novel control member which comprises a spring powered rotatable cam drum having a first portion associated with a switch means for the time delay indicating electric light means, a second portion associated with the movable electric lamp, and a third portion associated with the timer, the first, second and third portions of the cam drum being arranged so that rotation of the cam drum first will energize the electric lamp, then will effect movement of the lamp seriatim behind the series of apertures in the generally hollow frame portion, and will actuate the timer when the lamp reaches the last aperture in the series thereof. The aforesaid stop means stops rotation of the cam drum when a car has reached the second or finishing point.

In the preferred embodiment of the invention, the cam drum is a generally hollow cylindrical member mounted on the frame generally about the cylindrical axis thereof, the axis being arranged generally horizontal. The cam drum has an edge portion stepped axially and radially of the drum. A mounting carrier member is provided for the electric lamp. The carrier member is disposed above the cam drum, and has an edge portion stepped axially of the cam drum and comprises a cam follower which is biased against the stepped edge of the cam drum by gravity whereby the lamp is lowered in a path behind the vertically arranged apertures as the cam drum rotates. Means are provided to reset the electric lamp carrier member back to a raised inactive position.

Another feature of the invention is the provision of a handle secured to the cam drum and extending exteriorly of the frame, for grasping, whereby the cam drum may be rotated against the biasing of its power spring to cock the cam drum and thereby condition the timer for actuating. The handle may be in the form of a starting flag or the like.

Still a further feature of the invention is the provision of a manually movable member on the visual clock indicator to keep a record of at least one previous timing of a car.

Other objects, features and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawings.

DETAILED DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a timing apparatus for toy racing cars or the like, embodying the concepts of the present invention;

FIG. 2 is a vertical sectional view, on an enlarged scale, taken generally along the line 2—2 of FIG. 1;

FIG. 3 is a vertical sectional view taken generally along the line 3—3 of FIG. 2;

FIG. 4 is a partial sectional view taken generally along the line 4—4 of FIG. 3;

FIG. 5 is a fragmentary perspective view of certain of the interior components of the present invention, including the electric lamp carrier member and control cam drum; and

FIG. 6 is a fragmentary vertical sectional view taken generally along the line 6—6 of FIG. 2.

DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings in greater detail, the timing apparatus of the present invention, for use with toy racing cars or the like, is a self-contained unit having a generally hollow frame or housing, generally designated 10 in FIG. 1. The frame includes a lower body portion 12 and an upstanding tower portion 14. Most of the operative components of the timer are housed within the generally hollow frame 10. Before going into the details of the operating mechanism of the timing apparatus, it should be pointed out generally that a visual clock or timer indicator, generally designated 16, is disposed on the front face of the base portion 12 of the hollow housing and is operatively connected to the driving or power mechanism housed within the frame. The timer or power mechanism is conditioned for actuation by pressing down on a handle 18 in the form of a "starting flag." The timing apparatus has a built in time delay means to actuate the timer a predetermined time after depressing the flag 18 to permit an operator of a toy racing car or the like to depress the flag and condition the timer, and then move to his respective car at a starting point before the timer itself actually is started. Means, generally designated 20, is provided on the front face of the tower portion 14 of the hollow frame 10 to indicate the time progression of the time delay means. A gate 22, shown in phantom in FIG. 1, is operatively associated with the timer, by means to be described in greater detail hereinafter, to stop the timer automatically when a toy car knocks the gate out of the position shown.

Thus, with the apparatus of the present invention, a child or other operator of a toy racing car may push down on the flag 18 to condition the timing mechanism within the hollow frame 10, and move to his toy racing car at a remote starting point during the progression of the time delay means which is indicated at 20 on the front of the housing tower portion 14 to ready his racing car before the time delay means runs out. At the end of the time delay, which is indicated at 20 on the housing tower portion 14, the child releases his racing car, directing it toward the gate 22. As the racing cars move toward the gate 22, the timer will run until the racing car displaces the gate 22. The visual clock indicator 16 will stop, with the tim-
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The timer is powered by a spring 24 (Fig. 2) which is operatively connected through a gear train, generally designated 32, to a governor generally designated 26 in FIG. 4. The governor is of a conventional type which includes a star wheel 28 operatively associated with a governor leaf 30 which has a recess 30a within which the star wheel 28 rotates. As is conventional, the size and angular disposition of the spokes of the star wheel 28 and the size of the recess 30a are such that the sides of the recess prevent continuous rotation of the star wheel 28 and require the star wheel to rotate in discrete increments as the governor leaf 30 oscillates in the direction of arrow A (Fig. 4). Should the governor leaf 30 be prevented from oscillating, the governor star wheel 28 will be prevented from rotating, thereby stopping the action of the power spring 24.

The power spring 24 is connected to a drive shaft 32. A control member in the form of a cam drum, generally designated 34, is mounted on the drive shaft 32 for rotation therewith. In addition to the control functions of the cam drum 34, to be described in greater detail hereinafter, the started flag 18 is connected rigidly to the cam drum 34 through an arm 36 which extends through a vertical slot 38 in the housing base portion 12. Thus, as the flag 18 and arm 36 are depressed in the direction of arrows B (Figs. 1 and 3), the cam drum 34 and the power spring 24 are cocked to condition the apparatus. An arcuate-shape gear rack 48 is disposed about a peripheral portion of the cam drum 34 and is adapted for meshing with a sprocket gear 50 fixed to a shaft 52 journaled in the housing base portion 12. The shaft 52 extends through the front face of the housing base portion 12, with an indicating arm 54 of the clock indicator 16 fixed to the exposed front end of the shaft 52 for rotation therewith. Thus, as the cam drum 34 is rotated in the direction of arrow B to condition the mechanism, the indicating arrow 54 also is moved to a start position. As the cam drum is rotated by the power spring 24, during at least a portion of the rotary movement of the cam drum, the gear rack 48 will cause the indicating arrow 54 of the visual clock indicator 16 to rotate therewith to time the movement of the racing car.

Before going into the time delay and indicating means of the present invention, the means for stopping the timer (as a result of the displacement of gate 22) will be described. Referring to FIGS. 2 through 4, an L-shaped stop lever, having a vertical leg 56 and a horizontal leg 58 is pivoted within the housing base portion 12 on a horizontal shaft 60 at the juncture between the horizontal and vertical legs. As best seen in FIG. 2, the horizontal leg 58 of the stop lever extends through an opening 62 at the rear of the housing base portion 12 so that the outer end of the leg 58 may be positioned to rest by gravity on top of the gate 22, as shown in phantom in FIG. 2. The upper end of the vertical leg 56 of the stop lever has a serrated portion 64 (FIG. 4) which is positioned for movement into and out of engagement with the governor leaf 30. Thus, when the horizontal leg 58 of the stop lever rests on top of the gate 22, the vertical leg 56 of the stop lever is spaced from the governor leaf 30 to permit the leaf to oscillate under the power of spring 24 to run the timer and associated mechanism. When a toy racing car hits the gate 22 and knocks the gate out from under the horizontal leg 58 of the stop lever, the stop lever will pivot about shaft 60 in the direction of arrow C (FIG. 2), because of the weight of the horizontal leg 58, and cause the serrated section 64 of the vertical leg 56 to move rearwardly into engagement with the governor leaf 30 to stop the oscillation of the governor leaf and thereby stop the timer.

In order to provide a delay between the time the flag 18 is depressed and the time the arrow 54 of the visual clock indicator 16 actually starts to move, the gear rack 48 on the cam drum 34 must be disposed about the periphery of the cam drum as shown in FIG. 6 (where the cam drum is in its fully cocked position). It can be seen that the forward end 66 of the gear rack 48 is spaced from the gear 50 so that the cam drum will rotate angularly in the direction of arrow D (FIG. 6) a given angular increment before the gear rack 48 meshes with the gear 50 to start rotation of the clock indicator arrow 54. As described above, this time delay permits a child to condition the mechanism by pushing down on the flag 18 and allows sufficient time for the child to move to the starting position for the racing cars before the clock indicator arrow 24 starts to move.

Means are provided to indicate the time progression of the time delay means described above. This means includes a plurality of apertures 68 arranged in a vertical series through the front face of the housing tower portion 14 behind which is disposed an electric light means, including an electric lamp 70 and a lens 72 (FIG. 2). The electric lamp 70 is mounted in a carrier member, generally designated 72, which is housed within the frame 10 for vertical movement in the direction of arrows E to move the electric lamp behind the vertical series of apertures 68. In order to synchronize the movement of the lamp carrier member 72 with the rotation of the cam drum 34, and thus the aforesaid time delay means, the cam drum is provided with an axially and radially stepped end 76 which is axially and radially stepped end 76, which is shown best in FIG. 2. The electric lamp carrier member 72 is provided with a complementary edge, generally designated 76, which is stepped vertically and axially of the cam drum. The stepped edge 76 of the carrier member 72 acts as a cam follower as the cam drum 34 rotates. The carrier member 72 is held in an upper, inactive or start position, as best shown in FIGS. 2 and 3, by a locking lever 78 which has a tongue portion 78a which locks under one of the first steps on the stepped edge of the carrier member 72, as best seen in FIGS. 2 and 3. After the cam drum is cocked by pushing down on the flag 18 in the direction of arrows B (FIGS. 1 and 3), and the cam drum begins to rotate opposite the direction of arrows B the first step 80 of the stepped edge 74 of the cam drum abuts the tongue portion 78a of the locking lever 78 which releases the locking lever from under the carrier member 72. The carrier member thus will be biased by gravity against the top of the cam drum as best shown in FIG. 5. As the cam drum 34 continues to rotate in its operating direction, as indicated by the arrows D in FIGS. 5 and 6, the electric lamp carrier member 72 will move intermittently downwardly as the stepped edge 74 of the cam drum 34 successively releases successive steps along the edge 76 of the carrier member 72. Thus, the electric lamp 70 will move seriatim downwardly behind the apertures 68 in the front face of the housing tower portion 14. The stepped edge 74 of the cam drum 34 is disposed angularly relative to the rack gear 48 so that the carrier member 72 will be in its lowestest position, with the electric lamp 70 behind the lowestest aperture 68, when the gear rack 48 begins to mesh with the gear 50 to start rotation of the clock indicator arrow 54. A wall 84 between the housing base and tower portions 12 and 14, respectively, has a T-shaped slot 85 to guide the movement of the carrier member 72. The carrier member 72 for the electric lamp 70 may be reset to its elevated position by grasping a knob 86 (FIG. 1) which is connected to the top of the carrier member through a slot 87 and which is exposed exteriorly of the housing tower portion 14 and manually raising the carrier member until the tongue 78a of the locking lever 78 pivots under the carrier member to lock the carrier member in its elevated position as shown in FIGS. 2 and 3.

Preferably, the apertures 68 are different colors. In the preferred embodiment of the invention, the lowestest aperture is spanned by a translucent material having a green color to indicate when the timer will start. All of the apertures above the lowestest aperture may be covered with a translucent material having a different color or colors, such as yellow, the "caution" color.

The clock indicator 16 has a "record" arrow 89 which is manually settable to keep a record of at least one previously timed car.
In order to energize the electric lamp 70 only when the mechanism is cocked to condition the timer, and in order to deenergize the lamp at a predetermined time thereafter, the electric lamp is connected through batteries 88 (FIG. 2) to a pair of contacts, generally designated 90 (FIGS. 3 and 6). The contacts 90 normally are held open. About a portion of the periphery of the cam drum 34 is provided a raised cam portion 92 which, as best seen in FIG. 6, closes the contacts 90 when the cam drum 34 is cocked or conditioned and opens the contacts after the “green” light through the lowermost aperture 68 is energized.

The foregoing detailed description has been given for clearness of understanding only and no unnecessary limitations should be understood therefrom as some modifications will be obvious to those skilled in the art.

I claim:

1. A timing apparatus for use with toy racing cars or the like to time a toy racing car as it travels from a starting point to a second point, comprising: a frame; a timer mounted on the frame and having a visual clock indicator; actuating means operatively associated with said timer and including time delay means to actuate the timer a predetermined time after conditioning of the actuating means to permit an operator of a car to condition the actuating means and then move to his respective car at said starting point before said timer is actuated; and means to stop said timer automatically when a car reaches said second point.

2. The apparatus of claim 1 wherein said timer stop means includes gate means at said second point engageable by a toy racing car.

3. The apparatus of claim 2 wherein said timer stop means includes a stopping lever mounted on said frame and releasable on displacement of said gate means by a toy racing car.

4. The apparatus of claim 1 including means associated with said time delay means to indicate the time progression of the time delay means.

5. The apparatus of claim 4 including a plurality of visual indicating devices arranged in a series on said frame and means to effectively energize said indicating devices seriatim during the time period of said time delay means.

6. The apparatus of claim 5 wherein said indicating devices comprise electric light means.

7. The apparatus of claim 6 wherein said actuating means includes a control member mounted on said frame and associated with said timer and with a switch means for said electric light means, the control member being adapted to actuate said switch means to energize said light means a predetermined time before actuating said timer.

8. The apparatus of claim 7 wherein said control member comprises a spring powered cam drum rotatably mounted on said frame and having a handle portion extending outwardly therefrom for grasping to cock the cam drum.

9. The apparatus of claim 6 wherein said frame includes a generally hollow portion having a plurality of apertures arranged in a series, and said electric light means comprises an electric lamp mounted within said generally hollow frame portion for movement seriatim behind said apertures.

10. The apparatus of claim 9 including means at the last of the apertures in said series to give off a green colored light when said lamp is positioned behind the apertures.

11. The apparatus of claim 9 wherein said actuating means includes a control member mounted on said frame and associated with said timer and said electric light means to actuate said timer after said electric lamp reaches the last aperture in said series thereof.

12. The apparatus of claim 11 wherein said control member comprises a powered rotatable cam drum having a first portion associated with a switch means for said electric light means, a second portion associated with means for moving said movable electric lamp, and a third portion associated with said timer, said first, second and third portions of said cam drum being arranged so that rotation of the cam drum first will energize said electric lamp, then will effect movement of the lamp seriatim behind said apertures, and will actuate said timer after the lamp reaches the last aperture in said series thereof.

13. The apparatus of claim 9 including a powered, generally hollow cylindrical cam drum mounted on said frame for rotation generally about the cylindrical axis of the cam drum, the cam drum having an edge portion stepped axially and radially thereof, and including a mounting carrier member for said electric lamp, the mounting carrier member having a stepped cam follower portion biased against the stepped edge of the recessed portion of said cam drum, the stepped portion of the cam drum and the stepped cam follower portion of said electric lamp carrier member being oriented so that the carrier member moves said electric lamp intermittently behind said apertures in response to rotation of said cam drum.

14. The apparatus of claim 13 wherein said cam drum is mounted on said frame for rotation about a generally horizontal axis, said apertures are arranged in a vertical line, and said electric lamp carrier member is disposed above the cam drum and is biased thereagainst by gravity whereby the lamp is lowered intermittently in a path behind the vertically arranged apertures as the cam drum rotates.

15. The apparatus of claim 14 including means on said frame to guide said electric lamp carrier member in a vertical path.

16. The apparatus of claim 14 including means to reset said electric lamp carrier member and said cam drum to a relative starting position with the electric lamp disposed behind the first aperture of said series thereof.

17. The apparatus of claim 13 wherein said cam drum is spring powered and has a handle portion extending outwardly therefrom for grasping to cock the cam drum.

18. The apparatus of claim 1 including at least one manually movable member on said visual clock indicator to keep a record of at least one previously timed car.

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