Jan. 11, 1966 M. I. MAY 3,228,600

COUNTER MECHANISM

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FIG. 1.

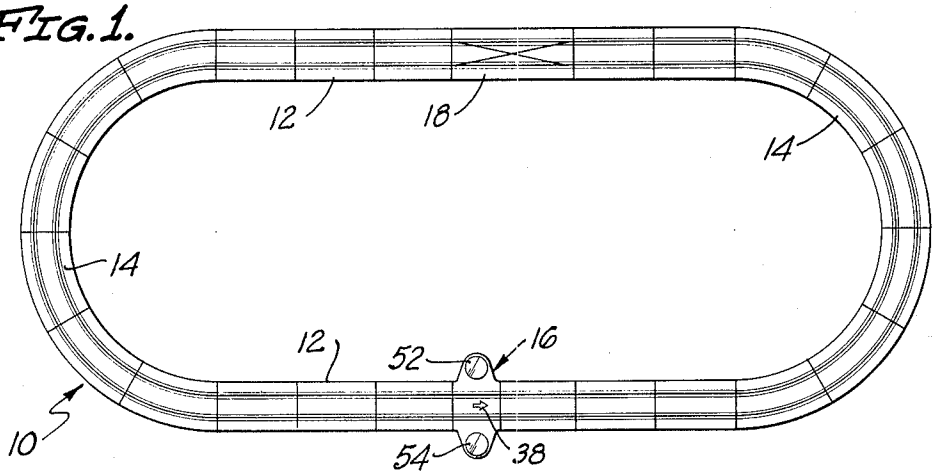


FIG. 2.

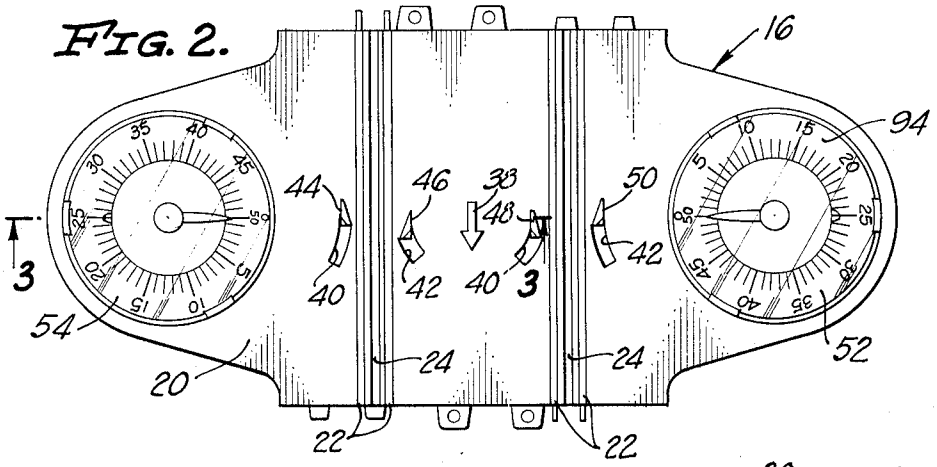


FIG. 3.

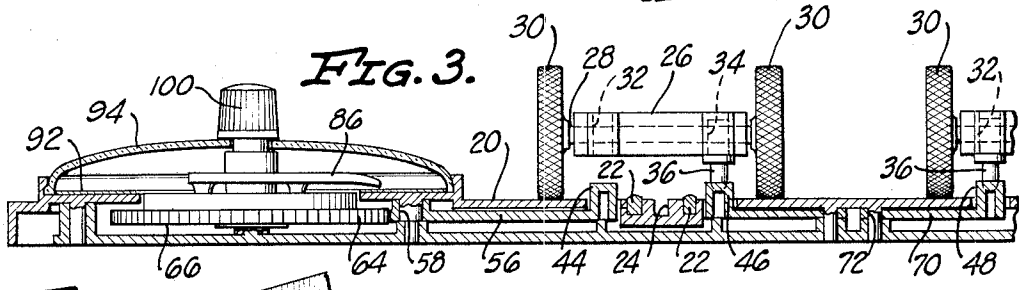


FIG. 8.

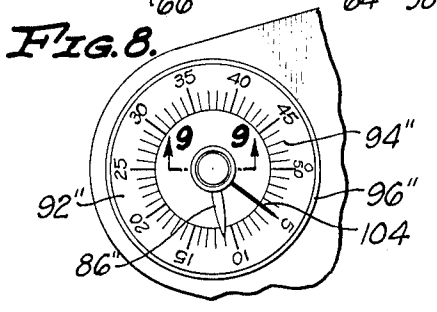
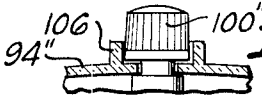


FIG. 9.



INVENTOR.
MARVIN I. MAY
BY
EDWARD D. O'BRIAN
ATTORNEY

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FIG. 4.

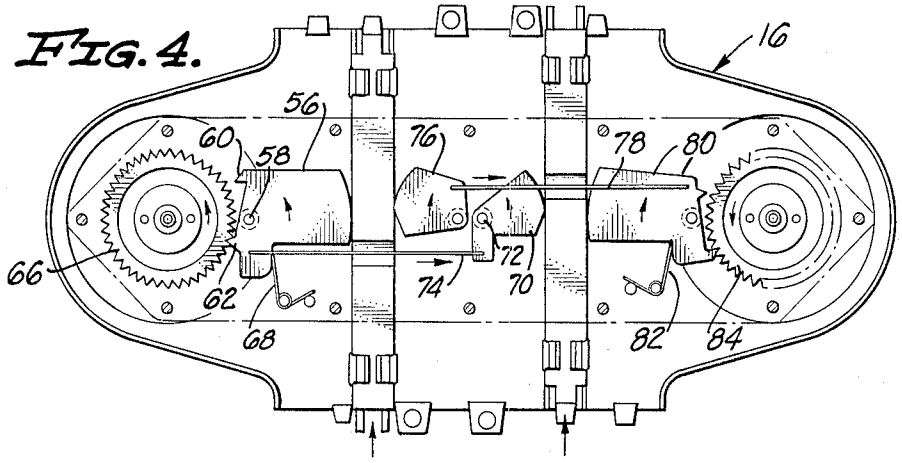


FIG. 5.

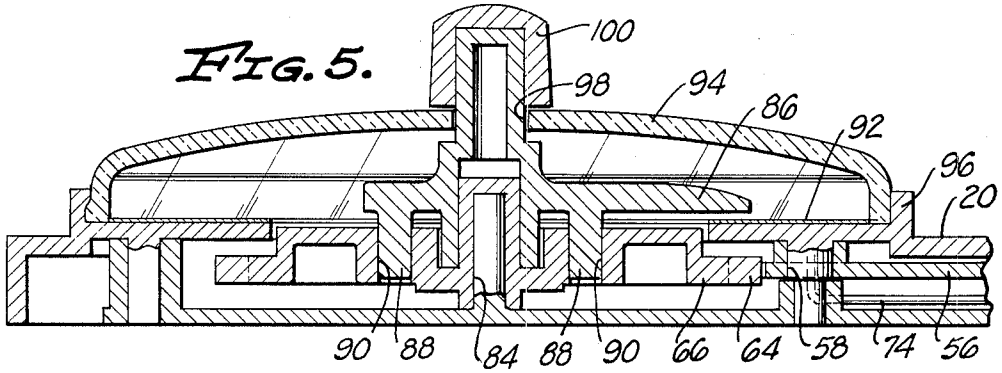


FIG. 6.

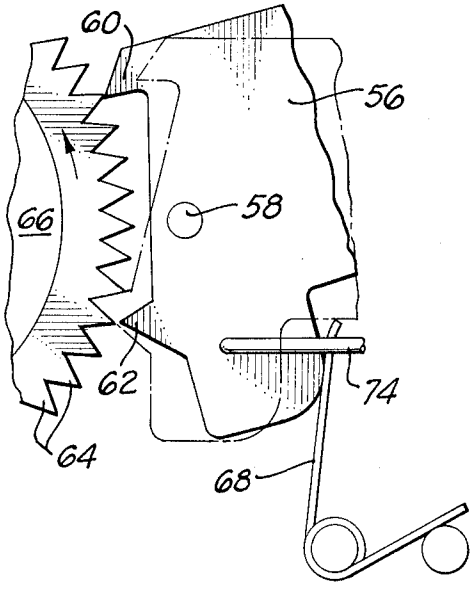
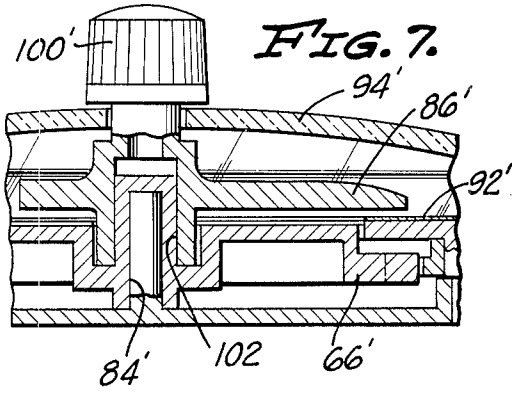


FIG. 7.



INVENTOR.
MARVIN I. MAY
BY
EDWARD D. O'BRIAN
ATTORNEY

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COUNTER MECHANISM

Marvin I. May, Los Angeles, Calif., assignor to Eldon Industries, Inc., Hawthorne, Calif., a corporation of California

Filed Apr. 16, 1963, Ser. No. 273,421
11 Claims. (Cl. 235—99)

This invention is directed to a counter mechanism for counting the laps of individual cars in road race car sets.

In summary, the invention is directed to counter mechanism means for individually counting the laps accomplished by separate cars. The counter mechanism is equipped with a counter dial for each car involved and each counter is arranged to be actuated by one of the individual cars. Accordingly, each counter mechanism corresponds to one of the cars, and each counter mechanism thus keeps track of the laps accomplished by its corresponding road race car. Means is provided adjacent each track to be actuated by the contestant cars and each contestant car is equipped with actuating means for the counter mechanism so that only its particular counter is actuated.

Such counters were unavailable in the past and led to disagreements between race car contestants, due to the fact that particularly in those installations where a cross-over track is installed, the laps accomplished by the individual cars are extremely difficult to totalize.

Accordingly, it is an object of this invention to provide a road race lap counter mechanism capable of individually counting the laps of each contestant road race car.

It is another object of this invention to provide a counter mechanism with selective means whereby the laps of each individual car are recorded on separate counter means.

It is another object of this invention to provide lap counter mechanism where the lap counter means is actuated by its individual car from either of any of a plurality of tracks, so that the road race car may be operated upon either of a plurality of tracks and have its laps individually recorded on its associated counter.

It is another object of this invention to provide means whereby the counter means may be re-set to zero for the start of a new race contest.

It is another object of this invention to provide a counter mechanism as set forth below designed to be inexpensively produced, and yet sturdy and long wearing and providing accurate counts.

Other advantages and objects of this invention will become apparent upon study of the following specification and attached drawings in which:

FIGURE 1 is a general plan view showing a track containing the lap counter;

FIGURE 2 is a plan view of the lap counter shown in FIGURE 1, rotated 90°;

FIGURE 3 is an enlarged partial elevational cross-section taken along the line 3—3 of FIGURE 2;

FIGURE 4 is a bottom view of the lap counter mechanism showing the bottom cover plate in phantom outline;

FIGURE 5 is an enlarged cross-section through one embodiment of the counter mechanism dial structure;

FIGURE 6 is a detail showing the ratcheting advancement structure of the counting dial;

FIGURE 7 is a partial section through another embodiment of the mounting of the indicating hand of the counter mechanism, similar to the showing of FIGURE 5;

FIGURE 8 is a partial plan view of the mechanism showing another embodiment of the counter; and

FIGURE 9 is a section through FIGURE 8 on the line 9—9.

Referring now to the drawings, the road race set is shown at **10**. The road race set is comprised of straight track sections **12**, curved track sections **14**, the counter mechanism **16** of this invention and, optionally, a cross-over switch track **18**. The cross-over switch track **18** can be operated either at the will of the contestants of the road race game, or may be periodically self-actuated. Additionally the road race set **10** includes a power supply, not shown, and a pair of road race cars. The road race cars are arranged to operate on the tracks of the road race set, and to be energized by the manually controlled power supplies. These road race cars individually actuate the counters of this invention. While an oval road race course is shown assembled in FIGURE 1, it is apparent that the individual track sections, since they are capable of being selectively connected to each other, can be installed in other configurations.

Referring now more particularly to FIGURES 2 and 3, the counter mechanism **16** has a top surface **20** in which are embedded electrical conductors **22**, between which is located a guide groove **24**. A guide vane on the road race car engages in the guide groove **24** and guides the road race car along the track. While in this guided position, suitable electric brushes engage upon the electrical conductors **22** and the brushes are connected to the drive motor in the car so that power supply connected to the conductors **22** controls the motor and thus the speed of the individual road race cars.

A portion of the frame or chassis of such a road race car is shown at **26**. This frame portion carries a front axle **28** upon which are mounted wheels **30**. The frame carries a right socket **32** and a left socket **34**. An actuating pin **36** is placed in one of the sockets **32** or **34**. In the road race car frame shown at the left of FIGURE 3, this pin **36** is placed in the left socket **34**. In the partial showing of the road race car at the right of FIGURE 3, the pin **36** is shown in the right socket **32**. The pins **36** are interchangeable in the two sockets, but for proper operation of the counter mechanism, they are placed in opposite sockets in the different race cars. The actuating pins **36** protrude below the road race cars and are thus in a position to actuate the corresponding counter mechanisms as is hereinafter described.

Referring more particularly to FIGURE 2, the road race counter mechanism **16** carries an arrow **38** showing the correct direction of operation of the road race cars across the counter mechanism. For the purposes of this application, the terms "right" and "left" are used in the sense of direction of operation of the road race cars. Thus, those parts which are on the right side of the road race car operated in its normal direction of motion, are referred to as being on the right in this application.

Apertures **40** are provided on the right-hand side of the tracks shown in FIGURE 2, and apertures **42** are located on the left of the individual tracks. Protruding from the apertures **40** and **42** are fingers **44**, **46**, **48** and **50**. The fingers **44** and **48** are located on the right-hand sides of the two tracks and the fingers **46** and **50** are located on the left side of the individual tracks. These fingers are located in such a position that they will be selectively actuated by the pins **36** carried on the frame **26** of the race cars. When a car carrying a pin in its left socket **34** passes down the right-hand track, the pin **36** will engage with the finger **46** to actuate the left-hand counter **52** by the mechanism which is hereinafter described. If the same car passed down the left-hand track of FIGURE 2, the actuating pin **36** would engage with finger **50** to also actuate the left-hand counter **52**. Similarly, a race car with its actuating pin **36** located on the right-hand side of its frame **26** in passing down either of the tracks, would actuate the right-hand counter **54**.

The finger **44** is mounted on pawl plate **56** which is pivoted at **58**. The pawl plate **56** carries pawls **60** and **62**, see FIGURES 4 and 6, which alternately engage

between the teeth 64 on ratchet wheel 66. A spring 68 urges the pawl plate 56 in a clockwise direction around its pivot 58 to urge pawl 62 between the teeth 64 on ratchet wheel 66. This position is shown in FIGURE 4, and is shown in phantom outline in FIGURE 6. In this position the finger 44 is in the position of FIGURE 2. When an actuating pin 36 engages with finger 44, the pawl plate 56 is moved from the dot-dash line position of FIG. 6 (which is shown in full lines in FIG. 4) into and beyond the full line position shown in FIGURE 6, so that its pawl 60 advances the ratchet wheel 66 somewhat more than one-half tooth space in a counter clockwise direction as seen in FIGURE 6. The partially actuated position as shown in FIGURE 6, and further counter clockwise motion of the pawl plate 56 occurs, so that the pawl tooth 60 further engages with the teeth 64 to advance the ratchet wheel 66 toward its new position. Upon release of the finger 44 by passing of the actuating pin 36, the spring 68 returns the pawl plate 56 and the pawl 60 engages between the next pair of teeth 64 to position the ratchet wheel 66 one tooth space forward and lock it in position.

The finger 48 is mounted on a finger plate 70 which is pivoted at 72. A connecting rod 74 is pivotally connected to the finger plate 70 and to the pawl plate 56 so that actuation of the finger 48 rotates the finger plate 70 about its pivot 72 in a counter clockwise direction as seen in FIGURE 4, and through the agency of connecting rod 74, which is pivotally connected to the pawl plate 56, the pawl plate 56 is actuated to advance the ratchet wheel 66 by one tooth. Through this mechanism, actuation of either finger 44 or 48 by actuating pin 36 causes advancement of the ratchet wheel 66 by one tooth.

A similar structure is provided to actuate the left-hand counter 52. In this case, the finger 46 is carried on a finger plate 76 which is connected by connecting rod 78 to actuate pawl plate 80. Pawl plate 80 carries finger 50, and is spring urged in the counter clockwise direction by spring 82, as seen in FIGURE 4. Pawl plate 80 carries pawls which engage with ratchet wheel 84 to cause its advancement by one tooth each time either the fingers 46 or 50 are actuated. The small arrows in FIGURE 4 indicate the direction of each of the parts from non-actuated to the actuated position.

As can be best seen in FIGURE 5, the ratchet wheel 66 is pivoted at 84 and carries a pointer 86. The pointer 86 is rigidly secured to the ratchet wheel 66 by means of pins 88 on the pointer 86 engaging in suitable holes 90 in the ratchet wheel 66. The pointer 86 extends over a card 92 which carries indicia, as are better seen in FIGURE 2, indicating the number of laps through which the corresponding car has passed. The indicia correspond to the number of teeth on the ratchet wheel 66 and in the instant device the counter is capable of counting 50 laps. A transparent crystal or plastic cover 94 covers the pointer 86 and card 92, and is set in bezel 96. The crystal 94 has an aperture 98 through which a setting shaft which is part of the pointer 86 extends. Knob 100 is secured to the shaft and accordingly to the pointer 86. Manual rotation of the knob 100 causes the ratchet wheel 66 to turn to oscillate the pawl plate 56 through the agency of its pawls 60 and 62, and thus resetting of the pointer 86 is accomplished.

The embodiment of FIGURE 7 relates to the method of resetting the pointer 86, and in FIGURE 7 the similar parts are identified by the same numerals as FIGURE 5, but carrying primes. As can be seen from FIGURE 7, the pointer 86' is rotatably mounted upon ratchet wheel 66' on a cylindrical bearing 102. The dimensions of the mating parts of the cylindrical bearing 102 are such that a frictional drive of the pointer 86' results from actuation of the ratchet wheel 66'. This frictional fit is such that manual turning of the knob 100' permits

repositioning of the pointer 86' without actuation of the pawl plate 56.

In the further modification in FIGURE 8, the pointer 86'' may be driven from the ratchet wheel 66 in either of the manners shown in FIGURE 5 or 7. Similar parts are identified by the same number carrying a double prime. In this embodiment the crystal 94'' is rotatably frictionally set in its bezel 96'', and the crystal is provided with an indicating pointer 104 on its underside. As is best seen in FIGURE 9, the crystal 94'' is provided with a knob 106 by means of which the crystal 94'' may be manually rotated. The purpose of the pointer 104 is to be able to separately adjustably indicate the position of the pointer 86''. It may be necessary to interrupt a race contest for reasons of external interruption, or for the purpose of testing one or both of the cars, and in this case it is desirable to indicate the status of the race contest at the beginning of such interruption. Then the race contest may be resumed at the same place it was interrupted. Furthermore, this pointer 104 can be used to indicate handicap starts and the like.

This invention having been described in its preferred embodiment, it is obvious that numerous embodiments within the skill of the routine engineer are possible. Therefore, the scope of the invention is defined by the appended claims.

I claim:

1. A road race counter mechanism, said road race car counter mechanism comprising:
   - first and second road race car guide means on said counter mechanism;
   - first and second counter means located on said counter mechanism;
   - first and second car detecting means located adjacent each of said road race car guide means, said first car detecting means each being connected to said fist counter and said second car detecting means each being connected to actuate said second counter;
   - said car detecting means being selectively actuatable by race cars being guided by said guide means.

2. The structure of claim 1 wherein road race cars being guided by and traversing said guide means selectively physically actuate said counter means.

3. The structure of claim 2 wherein said counter means are resettable.

4. In a road race car counter mechanism having first and second guide means for road race cars and first and second counter means for indicating the passage of road race cars past said counter mechanism, the improvement comprising: first and second fingers adjacent each of said first and second road race car guide means, said first and second fingers being arranged to be selectively actuated by the passage of a road race car past said fingers, said first fingers being both connected to first counter means and said second fingers being both connected to said second counter means and actuating means upon the road race car for selectively actuating said first fingers and said second fingers.

5. The structure of claim 4 wherein said fingers are arranged to be physically actuated by the passage of said road race car.

6. The structure of claim 5 wherein said fingers protrude adjacent said guide means to be selectively actuated by said road race car.

7. The structure of claim 6 wherein said counter mechanism has a top surface which acts as a roadway for said road race cars, mechanism connecting said fingers to said counter means, said mechanism being located below the top surface of said counter mechanism.

8. A road race car set, said road race car set comprising:
   - a counter mechanism, track sections adjacent said counter mechanism and first and second road race cars;
   - said counter mechanism having a top surface, said top

surface of said counter mechanism acting as a roadway for said road race cars, said top surface of said counter mechanism being in substantial vertical alignment with the top surface of said adjacent road race track sections;

first and second counter means in said counter mechanism;

first and second guide means on said counter mechanism;

first and second race car detecting means adjacent each of said first and second guide means, said first race car detecting means each being connected to actuate said first counter means and said second race car detecting means each being connected to actuate said second counter means.

9. The structure of claim 8 wherein said first and second race car detecting means comprise fingers attached to said counter actuating mechanism, said fingers extending into a position where they are selectively actuated by said road race cars.

10. The structure of claim 9 wherein said first road race car carries actuating means capable of actuating only said first fingers, and said second road race car carries actuating means capable of actuating only said second fingers.

11. The structure of claim 10 wherein said counter means are resettable.

References Cited by the Examiner

UNITED STATES PATENTS

760,661	5/1904	Strasburger	235—98
2,548,495	4/1951	Robins	273—86.2
2,631,853	3/1953	Haynes	273—86.2
3,077,301	2/1963	Conlin	235—98

FOREIGN PATENTS

503,477	4/1939	Great Britain.
907,252	10/1962	Great Britain.

LEO SMILOW, *Primary Examiner.*