Jan. 4, 1966 E. V. PULLEN 3,227,825

VISCOUS RETARDED TIMER AND FLAGMAN

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FIG. 1.

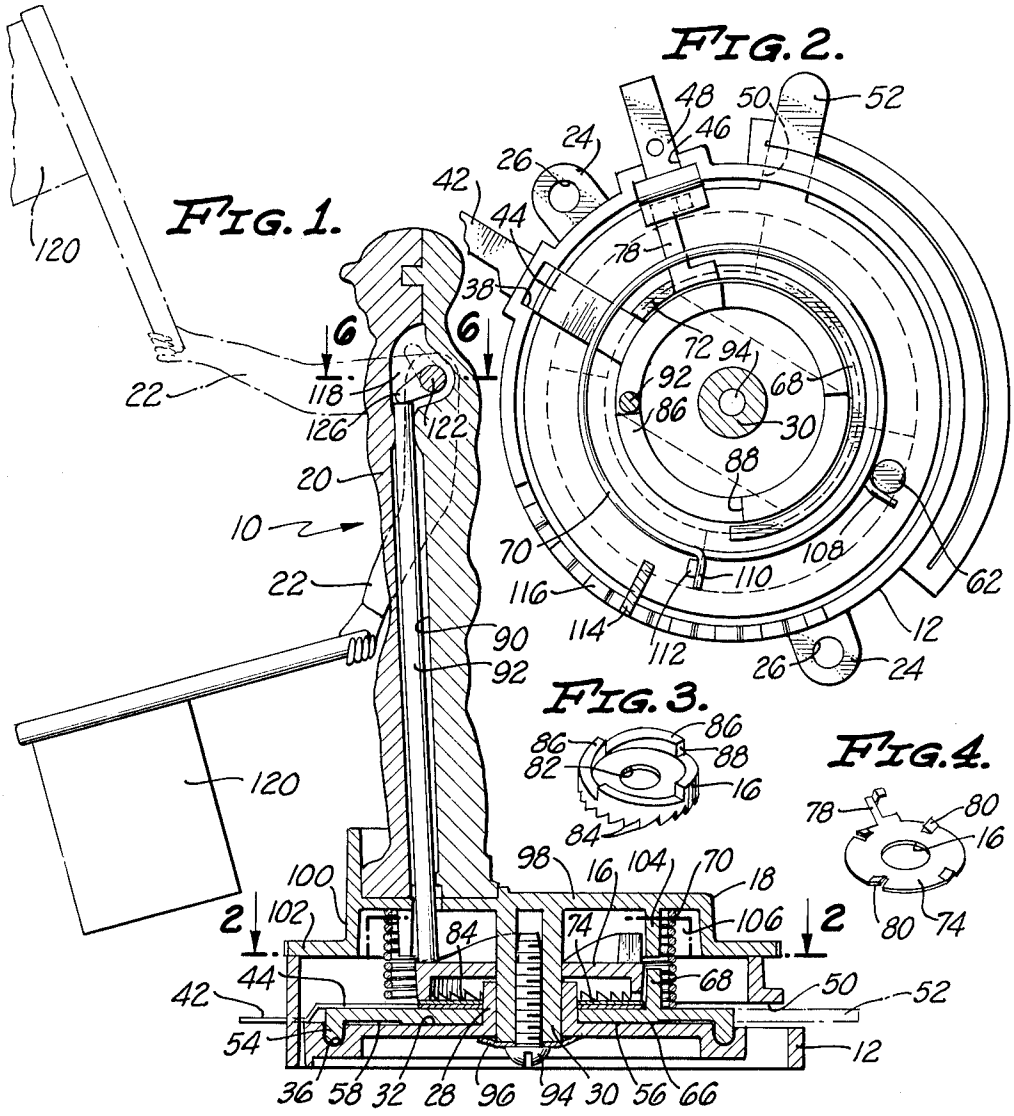


FIG. 2.

FIG. 3.

FIG. 4.

FIG. 5.

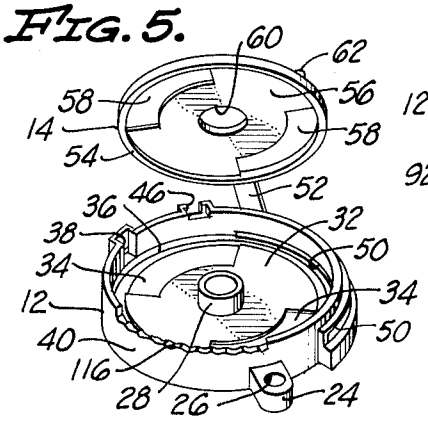
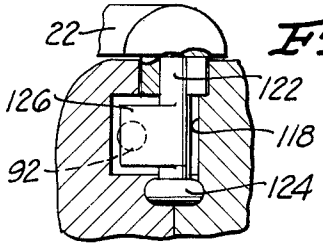


FIG. 6.



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VISCOUS RETARDED TIMER AND FLAGMAN

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This invention is directed to a toy starting flagman for use with road race games.

Road race games are those where model race automobiles are put in competition with each other on a model race track. The race track is a closed loop and may be of a number of different configurations for it is normally constructed of detachable straight and curved track sections. Each of the track sections has a pair of guideways for guiding the road race cars thereon. Additionally, each of the track sections has electric conductors adjacent each of the guideways for furnishing electric power to the road race cars passing therealong. A road race car is placed on each of the guideways and in connection with the electric conductors. Supply of electric power to the conductors will cause the cars to move through automotion. Control of the voltage of the electric power controls the speed of the race cars. Since each of the conductor pairs can be controlled independently by a pair of contestants, a true model race occurs. The track is designed in such a way that too great a velocity around the corners therein will cause the race cars to spin out and have loss of control so a true competitive, skill game is present in these road race car race sets.

Realism has been approached as closely as possible, especially the realism of actual control of the automobile during racing conditions. One point where realism has been missing in past construction, however, is the fact that the contestants have had to have their own countdown for the starting gun. Accordingly, the counter had the advantage in starting his race car at the very exact point of the start of the race, for after all, he was the one who was doing the counting. To obviate this difficulty and to add to realism to this factor in the road race game, it is an object of this invention to provide a starting flagman which provides a starting signal to the race contestants.

It is another object of this invention to provide a starting flagman for road race game sets wherein the starting flagman operates his timing at random, and at the end of the timing closes an electric circuit for the energization of power to the road race cars.

It is another object of this invention to provide a starting flagman for such road race sets with the starting flagman having a flag which is raised and then dropped, the dropping occurring substantially upon the making of the contact in the electric supply to the road race cars.

It is another object of this invention to provide an economic yet reliable and trouble-free starting flagman for signaling initiation of races in the road race game set.

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

FIGURE 1 is a side elevational section of the starting flagman of this invention;

FIGURE 2 is a section taken along the line 2—2 of FIGURE 1;

FIGURE 3 is a perspective of one of the elements of the starting flagman of this invention;

FIGURE 4 is a perspective of one of the electric contacts in this starting flagman;

FIGURE 5 is a perspective of the two timing elements of this invention; and

FIGURE 6 is a section on the line 6—6 of FIGURE 1.

In summary, this invention is directed to a starting flagman which both makes an electric contact and drops a flag at the end of a random period of time to indicate the initiation of a road race. The starting flagman comprises a fixed base which forms the lower half of a viscous timer. Mounted thereon is the movable portion of the viscous timer, the movable portion having an arm extending out of the side of the fixed base for cocking the timer. A spring is connected between the movable portion of the viscous timer, and a timer adjustment section adjusts the spring tension to adjust the torque on the viscous timer. The viscous timer drives both an electric contact and a ratchet mechanism, the ratchet mechanism in turn driving a cam which raises and drops the flag of the model starting flagman mounted on the timer adjustment section. The viscous timer is in the form of two substantially planar elements which have relieved portions in the form of circular arcs. A grease located between these two planar elements controls the rotational velocity of one with respect to the other for the shear energy required to shear the grease goes up as velocity increases.

A more detailed understanding of this invention will become apparent upon study of the following portion of this specification wherein the starting flagman is described in detail with reference to the drawings. Referring now to FIGURE 1, the starting flagman is shown generally at **10**. The flagman comprises a relatively stationary base **12**, a moving timer member **14**, a ratchet driven flag operator **16**, a timer adjusting section **18** and a flagman **20** mounted on the section **18** and having a movable flag-carrying arm **22**.

As is seen in FIGURES 1 and 2, and as is best seen in FIGURE 5, the base **12** comprises a part having a substantially flat bottom for securement to a suitable surface adjacent to or on the road race car set. To facilitate such attachment, lugs **24** having holes **26** therethrough adapt the base **12** for attachment to a suitable supporting surface. The base **12** has a central boss **28** for reception through a hole therein of the shaft **30** of the timer adjusting section **18**. Surrounding the boss **28** is a substantially planar area **32** which has two arcuate depressions **34** depressed with respect to the plane thereof to control the area thereof. A circular depression **36** surrounds the planar area **32** and the arcuate depressions **34**. A slot **38** in the outer wall **40** permits the end **42** of a first electric connector **44** to extend to the outside of the wall **40**. A slot **46** in substantially vertical position permits retention of a second electrical connector **48**. A further slot **50** in the outer wall **40** permits egress of the actuating handle **52** of the timer member **14**.

The timer member **14** fits within the outer wall **40** and has a depending circular flange **54** which fits within the circular depression **36**. The bottom of the timer member **14** is substantially planar within the confines of the circular flange **54** and presents a planar area **56** facing the planar area **32**. Similarly to the area **32**, the planar face **56** has two arcuate depressions **58** away from the plane of the base **56** to reduce the area thereof in a selective manner. The depressions **58** are so positioned with respect to the depressions **34** that when the actuating handle **52** is moved all the way downward in this slot **50**, as viewed in FIGURE 2, the arcuate depressions **58** substantially correspond in position to the arcuate depressions **34**. A hole **60** is provided in the timer member **14** so that it may embrace the boss **28**. The timer member **14** is also provided with a lug **62** for engagement by a spring, as is hereinafter described. During assembly of the timer member **14** into the base **12**, the planar surfaces **32** and **56** are coated with a grease of such characteristics that its shear viscosity does not change substantially with temperature. Thus, the shear energy nec-

essary to move the timer member 14 is substantially independent of temperature. Such grease is shown at 66, the modern grease most readily meeting these requirements being of the silicone variety.

In addition to the spring lug 62, the upper side of the timer member 14 has projecting therefrom a hemi-cylindrical shell 68 to assist in the guidance of the spring 70 embraced therearound. An additional projection 72 projects from the top of the timer member 14 adjacent to, but spaced from, one of the ends of the hemi-cylindrical shell 68. The first electrical conductor 44 is a substantially flat piece of electrically conductive metal having a hole therein lying around the boss 28. The electrical conductor 44 is held relatively stationary by means of having its end 42 extending out of the slot 38. A movable electrical contact member 74, see FIGURE 4, is made of resilient electrically conductive material, preferably spring brass or alloyed copper, and is provided with a central hole 76 which lies around the boss 28. The contact end 78 of the electrical contactor 74 extends out of the space between the hemi-cylindrical shell 68 and the additional projection 72 in line therewith. Accordingly, the electrical contactor 74 rotates with the timer member 14. The first electrical connector 44 is in electrical contact with the movable electric contact 74, by having it lie adjacent thereto, and when the contact end 78 of the movable contact 74 comes in contact with the second electrical connector 48, electrical continuity ensues. Such continuity is present when the timer member 14 is in the position shown in FIGURE 2, with its actuating handle 52 in the counter-clockwise position shown therein.

Referring again to FIGURE 4, movable electrical contact 74 has four pawls 80, arranged in quadrature, and extending resiliently upward from the upper surface thereof. The flag operator 16, seen in FIGURE 3, mounts on top of the movable electric contact 74 and embraces the shaft 30 by means of the hole 82 therein. Ratchet teeth 84 formed on the bottom of the flag operator 16 are engaged by the pawls 80 so that counter-clockwise rotation of the contact 74 causes the pawls 80 to engage the ratchet teeth 84 and drive the flag operator 16 in a counter-clockwise direction. The flag operator 16 carries on its upper face four cam faces 86 each of which present a spiral upward slope terminated by a vertical face 88. These faces are also arranged in quadrature in appropriate relationship to the ratchet teeth 84 for correct operation as is hereinafter described.

As has been hereinbefore described, the flagman 20 is mounted on the timer adjusting section 18. The flagman 20 contains an upwardly extending passage 90 in which is located a flag actuating bar 92. This bar extends downwardly through an appropriate aperture in the timer adjusting section 18 to engage upon the top of the cam spiral face 86. Accordingly, when the actuating handle 52 is moved in the clockwise direction as seen in FIGURE 2, one of the vertical cam faces 88 engages with the side of the bar 92 and rotation of the flag operator 16 is restrained. The movable electrical contact 74, however, moves with the timer member 14 and the pawls 80 ratchet over the teeth 84. When the actuating handle 52 is moved in the counter-clockwise direction toward the position shown in FIGURE 2, the upwardly rising slopes of the cam faces 86 cause raising of the flag actuating bar 92, and substantially when the electrical contact is made between the contact end 78 and second electric connector 48, the bar 92 falls off of the appropriate cam spiral face 86 down the vertical face 88 and causes dropping of the flag as is hereinafter described.

The timer adjusting section 18 serves as a cover, it serves as a means to hold the timer mechanism together, and it serves as a means for adjusting the time interval of timeout of the timer. The timer adjusting section, in addition to carrying the flagman 20 on the upper surface thereof, has the shaft 30 extending downwardly therefrom. A screw 94 screws into a hole in the shaft 30, and

carries a washer 96 under its head to hold the timer adjusting section 18 downwardly upon the base 12. This structure is such that the timer adjusting section is rotatable on the base 12 by having the shaft 30 rotate within the boss 28. The upper surface 98 of the timer adjusting section 18 terminates in a cylindrical section 100 which in turn terminates in a radial portion 102 which is of such dimensions that it fits upon the top of the base 12. Depending downwardly from the inner portion of the upper face 98 is a generally cylindrical shell 104 which cooperates with the cylindrical section 100 to form a spring pocket 106. The cylindrical shell 104 faces the end of cylindrical shell 68 and acts as a spring guide for the spring 70.

As is best seen in FIGURE 2, the spring 70 has an end 108 which engages with the spring lug 62 on the top of the timer member 14. The other end of the spring 70 has an end 110 which engages with a spring lug 112 which is secured to the timer adjusting section 18 and occupies a portion of the spring pocket 106. The spring 70 is wound in such a manner and installed in the flagman in such a manner as to urge the timer member 14 in a counter-clockwise direction as is seen in FIGURE 2. It is clear that since the spring lug 112 is mounted upon the timer adjusting section 18, rotation of the timer adjusting section 18 adjusts the spring force tending to rotate the timer member 14. One portion of the radial flange 102 has a detent lug 114 depending therefrom. This dependent lug cooperates with undulations 116 formed along a portion of the top wall of the base 12. These parts cooperate to hold the timer adjusting section 18 in the same angular relationship as the base 12, but permit manual rotation of one with respect to the other for adjusting of the spring tension and accordingly adjustment of the time interval it takes the timer to time out.

As previously described, the flagman 20 contains an interior passage in which is located the flag actuating bar 92. As can be seen in FIGURES 1 and 6 the passage 90 and the flag actuating bar 92 terminate adjacent the shoulder of the flagman 20 at a transverse hole 118. The arm 22 of the flagman carries a flag 120 in its hand and at its shoulder has a shaft 122 which is located in the hole 118 and retained therein by means of a ball 124 formed thereon which is engaged in a suitable socket within the flagman. The shaft 122 within the hole 118 and the ball 124 within its socket are arranged for rotation so that the flagman may raise his arm 22 in response to raising of the flag actuating bar 92. To accomplish this, a lever 126 is secured to the shaft 122 adjacent the top edge of the bar 92 for engagement thereby.

In use, the flagman 10 is located adjacent the road race set and is electrically connected to the power supply by connecting the common wire from both of the sets of the track conductors through the electrically connectors 44 and 48. When it is desired to start a race, the actuating handle 52 is moved in a clockwise direction from the position seen in FIGURE 2 to its most clockwise limit. Thereupon, when both of the racers are ready, the handle 52 is released and the spring 70 urges the timer member 14 in the counter-clockwise direction. In view of the viscous drag of the grease between the surfaces 32 and 56, the time from the timer to time out is random and neither of the race contestants can be sure when the flag will drop. Accordingly, both wait while the flag slowly raises and finally drops. Thereupon the race commences. False starts are prevented by the fact that the electrical circuit is disconnected until substantially the time that the flag drops.

From the previous description it can be seen that this invention is susceptible to numerous minor modifications and embodiments within the skill and scope of the routine engineer without the exercise of the inventive faculty. Accordingly, the scope of this invention is defined by the scope of the appended claims.

I claim:

1. In a timer mechanism, a first substantially planar face and a second substantially planar face, said first and said second substantially planar faces facing each other, a spring connected between said first and said second planar faces to urge one of said planar faces with respect to the other of said planar faces in a direction substantially parallel to said substantially planar faces, said spring means being formed so that the force of said spring urging said one of said faces with respect to said other of said faces decreases as said one of said faces moves with respect to said other of said faces, a viscous material located between said substantially planar faces, said material absorbing energy when one of said faces moves with respect to the other of said faces, and said first and said second faces having recessed areas for reducing the surface between said faces wherein shear of said viscous material occurs.

2. The structure of claim 1 wherein one of said faces rotates with respect to the other of said faces.

3. In a timer mechanism, a relatively fixed base having a substantially planar area, a timer member mounted for rotation with respect to said base and having a relatively substantially planar area facing the substantially planar area of said base, guide means to guide said timer member in rotation with respect to said base, spring means connected between said timer member and said base, and adjustment means for adjusting the force of said spring to thereby control the torque of said timer member with respect to said base and viscous means between said substantially planar faces said planar areas having relieved areas to control the area of viscous shear of said viscous means, said relieved areas being related to the angular position of said timer member with respect to said base in such a manner that the area of shear said viscous means decreases as said spring rotates said timer member with respect to said base.

4. The structure of claim 3 wherein said viscous means is a grease.

5. The structure of claim 4 wherein a first electric contact is mounted on said base and a second electric contact is mounted on said timer member, said electric contacts contacting each other for electric continuity when said timer member reaches a predetermined position with respect to said base.

6. The structure of claim 4 wherein a cam is driven by said timer member, said cam producing a mechanical signal when said timer member reaches a predetermined position with respect to said base.

7. The structure of claim 6 wherein said base carries an electric contact and said timer member carries an electric contact, said electric contacts contacting each other when said timer member reaches a predetermined position with respect to said base and electrical continuity is achieved therebetween.

8. The structure of claim 7 wherein said timer is incorporated within a toy starting flagman for use with road race sets, and said mechanical signal is the raising and lowering of a flag.

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