Dec. 21, 1954 R. J. LOHR ET AL 2,697,300

TOY RACING AUTO

Filed Oct. 24, 1951 2 Sheets-Sheet 1

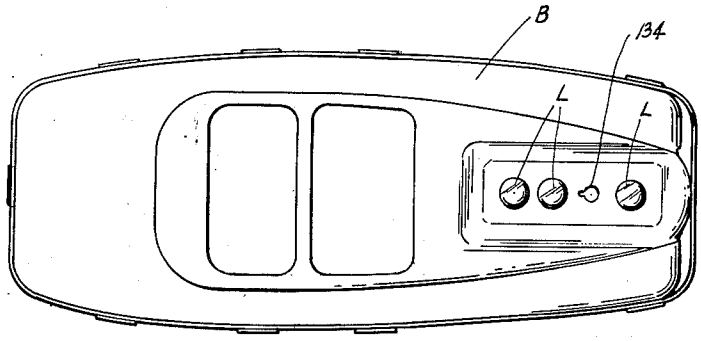


Fig. 1.

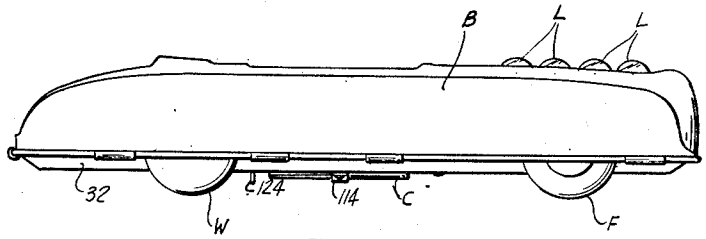


Fig. 2.

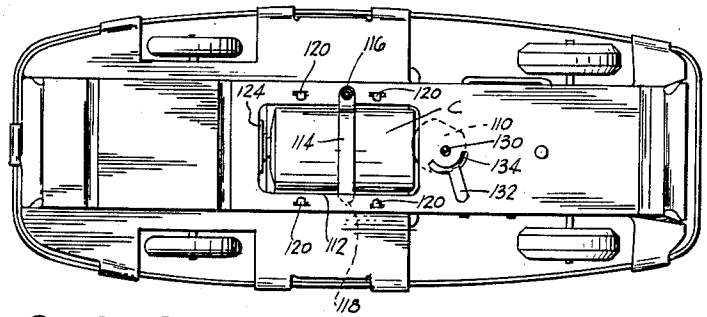


Fig. 3.

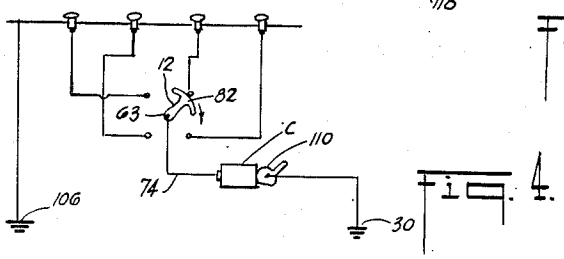


Fig. 4.

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2 Sheets-Sheet 2

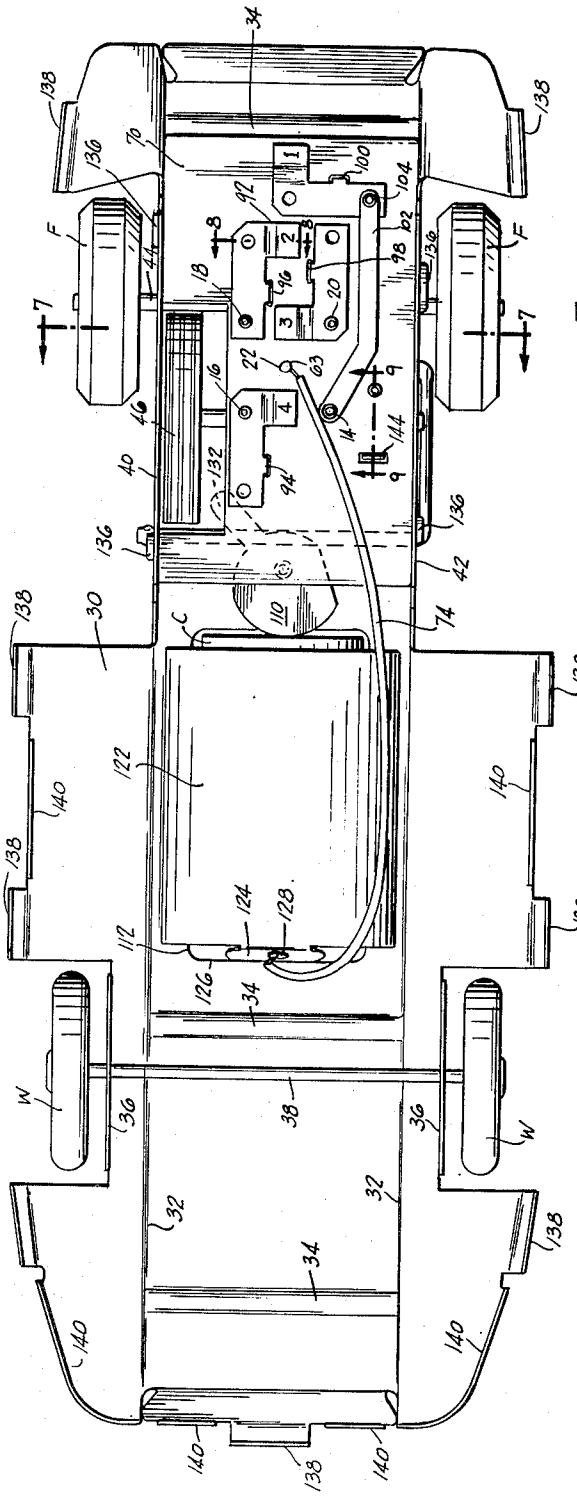


Fig. 5.

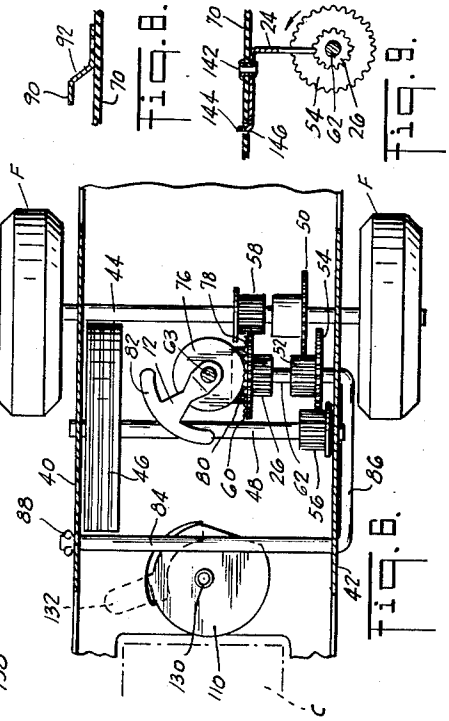


Fig. 6.

Fig. 8.

Fig. 9.

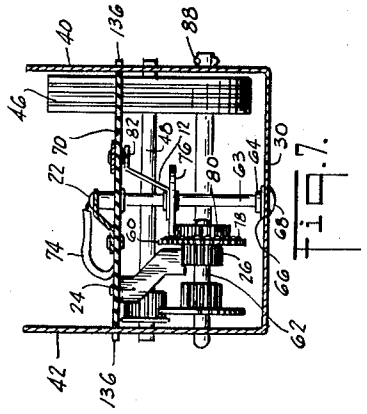


Fig. 7.

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TOY RACING AUTO

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11 Claims. (Cl. 46—111)

This invention relates to toys, especially those simulating vehicles using an internal combustion engine, and more particularly a toy racing auto.

The primary object of the present invention is to improve vehicle toys, especially racing auto toys, or in the current vernacular, "hot rod" cars. A more particular object is to give such toys a colorful and spectacular appearance by exposing at the engine hood a line of lamps, preferably red, and simulating either cylinder heads or open exhaust pipes leading directly from individual cylinder heads.

In accordance with a feature and object of the invention, the toy is provided with distributor mechanism to fire or flash the lamps is succession, preferably in a desired firing order rather than in sequence, which firing order may be made to correspond to the firing order in a true engine, if desired. Further objects of the invention are to simplify the structure of the toy, and the wiring needed for the flashing lamp circuits, so that the toy may be manufactured at low cost.

Still another object is to provide the toy with suitable motor means for propulsion and flashing of the lamps, and a still further object is to provide the toy with noise-making means to heighten the realism of its operation.

To accomplish the foregoing general objects, and other more specific objects which will hereinafter appear, our invention resides in the lamp, distributor switch, propulsion, and other toy elements, and their relation one to another, as are hereinafter more particularly described in the following specification. The specification is accompanied by drawings, in which:

Fig. 1 is a plan view of a toy racing auto embodying features of the invention;

Fig. 2 is a side elevation thereof;

Fig. 3 is a bottom plan view thereof;

Fig. 4 is a wiring diagram explanatory of the invention;

Fig. 5 is a plan view of the chassis, with the body of the toy removed;

Fig. 6 is a similar view of the forward end of the chassis, with the insulation distributor plate removed;

Fig. 7 is a section taken approximately in the plane of the line 7—7 of Fig. 5;

Fig. 8 is a detail taken on the line 8—8 of Fig. 5; and

Fig. 9 is another detail taken approximately on the line 9—9 of Fig. 5.

Referring to the drawing, and more particularly to Figs. 1 and 2, the toy racing auto there shown comprises a body B which may be streamlined and generally conventional in appearance. It runs on front and rear wheels indicated at F and W. The toy is distinctive in having a row of four electric lamps L exposed at the hood. These preferably have flattened bulbs, as in the case of flashlight lamps, and are preferably red. They may be considered to be in simulation of the cylinder heads of the engine, or of stubby individual exhaust pipes leading directly from the engine cylinders.

Referring now to Fig. 3, there is a source of electricity, preferably a battery cell of the flashlight type indicated at C. Referring next to Fig. 6, it will be seen that the mechanism of the toy includes a distributor arm 12, and this successively engages a ring of contacts, not shown in Fig. 6, but corresponding in number to the lamps. The contacts may be eyelets secured in an insulation plate, and the upper ends of the eyelets are indicated in Fig. 5 at 14, 16, 18 and 20, the shaft of the distributor arm being centrally located at the point 22. The distributor contacts are connected to the lamps, and the connections may be arranged in desired firing order if it be desired to more closely simulate a real engine. In this way the lamps are caused to flash intermittently and in a desired sequence.

For greater realism the toy may be provided with suitable noise-making means, and referring to Figs. 7 and 9 this may consist of simply a vibrator spring 24 mounted with its free end engaging the teeth of a vibrator gear 26.

Considering the toy in greater detail, and referring next to Fig. 5, the chassis portion of the toy is most simply made of a single piece of sheet metal 30 channeled or depressed longitudinally at 32 to stiffen the same, and provided with cross ribs or inverted channels 34 to further stiffen the same. The chassis is cut away to provide clearance for the rear wheels W, and some of the excess sheet metal is turned upwardly at 36 to provide bearing walls which are perforated to receive the rear axle 38. In the present toy the rear wheels are idle, and may be made of wood, plastic, or rubber. The forward wheels F are the driving wheels, and are preferably made of rubber.

The sides of the chassis are cut away to clear the forward wheels F and for a distance rearwardly thereof, and the excess sheet metal is turned upward to form vertical motor side plates 40 and 42. These side plates carry the shafts of the mechanism, including the front axle 44 on which the wheels F are secured, as is shown in Fig. 6.

In that figure it will be seen that in the present case the motor is a simple form of inertia motor, utilizing a flywheel 46 connected by a train of gearing to the axle 44. Thus the flywheel shaft 48 may be called a motor shaft, and in the case of a spring motor the gearing would multiply from a motor shaft to the axle 44, but in the case of the present inertia motor, the gearing multiplies from axle 44 to motor shaft 48. Specifically, the axle 44 carries a gear 50, meshing with an intermediate pinion 52, secured to or formed integrally with an intermediate gear 54, which in turn meshes with a pinion 56 secured to the flywheel shaft 48. Thus the flywheel is turned at high speed and stores up considerable inertia when the toy is pushed, and this carries the toy along for a considerable distance.

The motor frame also carries the distributor mechanism for intermittently flashing the lamps. More specifically, in the present case the axle 44 carries a pinion 58 meshing with a gear 60, which for convenience idles on the same shaft 62 that carries the intermediate gears 52, 54. However, it will be understood that gear 60 is not secured to the gears 52, 54, and turns at a different speed, for the ratio between axle 44 and gear 60 is a reduction ratio rather than a step-up ratio. This difference in ratio is not essential, but is preferable in order to slow down the flashing of the lamps sufficiently to make the operation clearly visible, for at very high speed much of the effect would be lost by "retention of vision" of the observer, and by the inertia of the heating and cooling action of the lamp filaments. Moreover, the distributor mechanism may be more cheaply manufactured, and will operate over a longer life, if operated at slower speed, as indicated.

Referring now to Fig. 7 of the drawing, the distributor shaft is preferably a vertical shaft indicated at 63. For reasons later explained it is preferably insulated from the chassis, and its lower end is therefore carried in a molded plastic bearing 64 secured in a hole in the metal bottom 30 of the chassis. It is provided with a flange 66 and is inserted from above and then expanded or riveted by the application of heat to expand the lower end 68, thus locking the bearing on the chassis. The upper end of distributor shaft 63 is carried in an insulation plate 70. For ease of electrical connection the plate 70 is preferably provided with a metal bushing 22 acting as a bearing for the upper end of shaft 63, and a flexible insulated electrical conductor 74 is secured to the bushing 22.

Shaft 63 carries an insulation gear 76 meshing with additional gear teeth connected to or, in this case, formed integrally with the gear 60. It will be seen that because of the right-angled relation of the shafts 62 and 63 the gearing might be bevel gearing or crown gearing or the like, but in the actual toy here shown the metal gear 60 is provided with radial teeth 78 on its side face and axial

teeth 80, the combination providing what might be termed "corner teeth." The gear 76 is a moderately soft rubber disc, so that its periphery tends to embed itself in the corner teeth 78 and 80. Thus the disc 76 is driven with a fairly positive drive, and because of the rubber material employed, the desired insulation of the distributor shaft is maintained.

The distributor shaft further carries the distributor arm 12, which is preferably made of resilient metal. As is best shown at 82 in Fig. 6, the free end of the arm 12 is preferably extended in arcuate form in order to prolong the flashing of each lamp until connection is almost made with the contact for the next lamp. For this purpose, and when dealing with four lamps, as in the present case, the arc 82 at the end of arm 12 may be as much as 90° in length, but also may be much shorter is shorter flashes are wanted. The free ends of the arc 82 are preferably turned downward in order to more smoothly slide over the contacts.

Because the idler shaft 62 (Fig. 7) is in the same plane as the distributor shaft 63, the shaft 62 is preferably a stub shaft which terminates short of the distributor shaft 63. It is held rigidly despite its overhung position, by means best shown in Fig. 6, in which it will be seen that shaft 62 forms one end of a rigid generally L-shaped member, including a long stem portion 84 and a connecting arm 86. The part 84 passes through both side plates 40 and 42, with the connecting portion 86 lying along the outside of the plate 42. The free end of the part 84 may be pinched as indicated at 88, thus holding it in position.

The insulation plate 70 previously referred to carries the circle of distributor contacts 14, 16, 18 and 20 (Fig. 5) disposed concentrically about the distributor shaft 63. It also carries the center contacts of the lamp sockets. Thus referring to Fig. 8 it will be seen that there is a piece of spring metal having a movable elevated portion 90 supported above insulation plate 70 by an offset bend indicated at 92. By locating the part 90 directly beneath the lamp bulb it acts as a contact against which the center terminal of the lamp is screwed.

Reverting now to Fig. 5 it will be seen that there are such contact portions indicated by the numerals 1, 2, 3 and 4, and corresponding to the lamps or engine cylinders. These lamp contacts are connected to the distributor contacts 14, 16, 18 and 20 previously mentioned, and the connection is preferably made by extending the sheet metal to reach the appropriate distributor contact. The contacts are preferably in the form of small brass eyelets, the lower ends or heads of the eyelets being exposed at the bottom face of the insulation plate 70 for engagement by the distributor arm therebeneath, and the upper end of each eyelet being riveted over the piece of sheet metal which acts also as the lamp contact. In most cases a single eyelet is sufficient to secure the metal in place because the metal is additionally provided with a downwardly turned tongue, and the insulation plate has a mating slot to receive the tongue, such tongues being shown at 94, 96, 98 and 100. In the case of lamp #1 and contact 14 an extra piece of metal 102 is shown with an additional eyelet at 104, but it will be understood that even here a single piece of metal may be employed if one does not mind the increase in scrap or waste when punching out the pieces from sheet stock.

The flexible insulated wire 74 previously referred to extends back to one terminal of the battery cell C, and the other terminal is grounded, thus completing the circuit.

The nature of the electrical circuit will perhaps be clearer from consideration of the schematic wiring diagram shown in Fig. 4 of the drawing. Referring to that figure it will be seen that the threaded bases of the lamps 1, 2, 3 and 4 are all grounded to the metal body of the toy, as indicated at 106. The center terminals of the lamps are each connected to one of the four contacts of the distributor, which are arranged in a circle about the distributor shaft 63. These contacts are sequentially engaged by the contact arm 82. The distributor shaft 63 is connected by the conductor 74 to the center terminal of the battery cell C, the opposite end of which is grounded to the chassis as indicated at 30. This is preferably done through a manually operable cam 110 acting as a switch. From inspection of Fig. 4 it will be seen that the distributor intermittently closes the lamp circuits, thus causing sequential flashing of the lamps. Moreover, it will be seen that the lamps may be lighted or "fired" in any desired firing order which, in Fig. 4, happens to be 1, 3, 4, 2. The firing order shown in Fig. 5 is somewhat different, but it is evident from the nature of the construction that any desired firing order may be obtained by appropriately shaping the metal plates which connect the lamps to the distributor contacts.

The battery C is held in a suitable housing which is preferably accessible from beneath the toy, so that the cell may be changed readily when worn out. Specifically, there is an opening in the chassis large enough to receive the cell, as shown at 112 in Fig. 3. The cell is slid upwardly through the opening and is then locked in position by means of a flexible metal strap 114. This is pivoted at 116, and its free end 118 is long enough to be slid upward past the edge of the opening, thus acting as a releasable support to hold the cell in position.

The housing receiving the cell may be made of sheet metal bent to trough shape, with its free edges having tongues indicated at 120, which are received in mating slots in the chassis. Referring now to Fig. 5 it will be seen that the inverted trough-shaped housing 122 includes an endpiece 124 which is bent downwardly from the top edge of the trough. It extends below the edge 126 of the battery opening 112 in the chassis, and so the edge 126 holds the end plate 124 against moving outward. A center contact is insulatedly mounted on the end plate, as indicated at 128, and conductor 74 is connected to this insulated center contact.

The cell C is preferably dropped in position with the center pole pointed rearward, as shown in Fig. 3, and thus bearing against the insulated center contact. The cell is preferably used with its customary cardboard jacket, thus insulating the cylindrical surface of the cell from the housing receiving the same. To complete the electrical circuit the opposite end or base of the cell is grounded by means of a cam-shaped member 110, best shown in Figs. 3, 5 and 6. This is pivoted at 130, and may be formed integrally with a radially extending arm 132, which passes through an arcuate slot 134 in the chassis. It will be understood from comparison of Figs. 5 and 6 that the circuit may be closed by swinging the control lever 132 to the position shown in Fig. 5, thus wedging the cam 110 against the end of the cell, and the circuit may be opened by swinging the control lever 132 to the position shown in Fig. 6, thus freeing the cam 110 from the cell which is located as shown in broken lines.

Referring now to Fig. 1, the hood portion of the toy body B is preferably depressed or recessed at the lamps L. This helps protect the lamps, for they project only slightly as shown in Fig. 2, and it improves the appearance of the toy. In Fig. 1 the second lamp has been removed, thus exposing the socket hole 134. This is a generally circular hole with a small notch at one point, the said notch freeing the peripheral edge so that it may be displaced in vertical direction to follow a helical path corresponding to the conventional thread on the metal base portion of the lamp. Thus the sheet metal edge itself acts as the female thread to receive the lamp. It will be understood that the height of the hood at the base of the trough is so related to the height of the insulation plate 70 (Figs. 5 and 7) that the bottom of the lamp reaches and even depresses somewhat the metal contacts shown at 1, 2, 3 and 4 in Fig. 5.

The insulation plate 70 is secured in position in very simple fashion, it being provided with four outwardly projecting tenons 136 which are received in mating slots in the vertical side plates 40 and 42.

The body of the toy is made of a single piece of sheet metal appropriately shaped and drawn to upwardly convex shape, including details such as the mudguards and cockpit, etc. The bottom edge is preferably rolled to form an edge bead. To assemble the toy it is merely necessary to add the body to the chassis, the latter having receptive channels with upwardly turned edges at a number of points—in this case nine points all marked 138 in Fig. 5. At other points there is an upward flange which is received inside the body to act as a locating means, such flanges being indicated at points marked 140. To assemble the toy the body is placed on the chassis with the flanges 140 inside and the edges 138 outside the lower periphery of the body. The edges 138 are then rolled inward to clench the same about the beaded lower edge of the body, thus permanently securing the two main parts of the toy together.

To heighten the realism of the toy it may be provided with a noise-maker in addition to the flash lamps. The construction of the noise-maker is best shown in Figs. 7 and 9, it comprising a vibratile spring metal arm **24**, the lower end of which projects into the teeth of a gear **26**. The gear **26** is preferably die cast integrally with the gear **60**. Rotation of the motor shaft or of the axle causes rotation of the vibrator gear **26**, which in turn causes a clatter produced by repeated bending and release of the spring arm **24**. The arm is secured in position by mounting the same beneath the insulation plate **70** previously referred to. It may be mounted by using a single eyelet **142** and a tongue **144** received in a mating slot **146** in the insulation plate **70**.

It is believed that the construction and operation of our improved toy vehicle, as well as the advantages thereof, will be apparent from the foregoing description. It will be understood that the toy may be provided with a different motor, for example, a spring motor on an electric motor, and may even be motorless, that is, it may be a pull toy designed to be pulled along by means of a string. The toy may be made to simulate a vehicle with a rear engine drive by simply reversing the general arrangement of the toy from end to end. It will then simulate a vehicle having a rear wheel drive with a rear engine. However, the toy may be made to simulate a vehicle having a rear wheel drive and a front engine by either running distributor wires forward from a distributor at the rear end to lamps at the forward end, or by having the drive motor at the rear end and having additional and separate gearing on the front axle to operate a distributor at the forward end.

It will also be understood that a six or eight-cylinder engine may be simulated by providing six or eight lamps, and that a V engine may be simulated by providing two rows of lamps disposed more nearly at the sides of the hood. In any case they may be arranged to simulate either cylinder heads or short open exhaust pipes. In the distributor mechanism the gear **76** may be made of hard fibre or other insulation and provided with teeth, instead of being made of soft rubber as here shown. Considered in its broadest aspect the toy need not necessarily simulate a vehicle, as it might simulate a multiple cylinder internal combustion engine used for some other purpose than vehicle propulsion.

It will therefore be understood that while we have shown and described our invention in a preferred form, many changes may be made in the structure shown without departing from the scope of the invention, as sought to be defined in the following claims.

We claim:

1. A toy racing auto comprising a sheet metal base or chassis, a battery housing for a flashlight cell, an axle, gearing to said axle, said gearing including a distributor drive gear, an upright distributor shaft carrying an insulated distributor gear meshing with the aforesaid distributor drive gear, a distributor arm carried by said distributor shaft, an insulation distributor plate disposed horizontally above the aforesaid gearing, said distributor plate having a ring of distributor contacts for engagement by said distributor arm, said distributor shaft being received in an insulation bearing at its lower end and by a bearing on the insulation distributor plate at its upper end, a series of lamp contacts mounted on top of said insulation plate and so shaped as to reach said distributor contacts, with the latter arranged in a circle and the lamp contacts arranged in alignment, the connections being in desired firing order, the hood portion of said auto having a line of socket holes for receiving lamps, a row of lamps screwed into said socket holes, the socket holes being so located that the lower ends of the lamps then engage the aforementioned lamp contacts carried by the aforesaid insulation distributor plate, a conductor extending from the distributor shaft to an insulated contact at one end of the aforesaid battery housing, and means for grounding the other terminal of the cell and thus closing the lamp circuit.

2. A toy auto as defined in claim 1, in which the distributor arm has a contact having an arcuate length which is a substantial part of the arcuate distance between the distributor contacts, whereby there is a relatively sustained illumination of one lamp or another as the auto runs.

3. A toy racing auto comprising a sheet metal base or chassis, a battery housing for a flashlight cell, an axle, gearing to said axle, said gearing including a vibrator gear and a distributor drive gear, an upright distributor shaft carrying an insulated distributor gear meshing with the aforesaid distributor drive gear, a distributor arm carried by said distributor shaft, an insulation distributor plate disposed horizontally above the aforesaid gearing, said distributor plate having a ring of distributor contacts for engagement by said distributor arm, said distributor shaft being received in an insulation bearing at its lower end and by a bearing on the insulation distributor plate at its upper end, a series of lamp contacts mounted on top of said insulation plate and so shaped as to reach said distributor contacts, with the latter arranged in a circle and the lamp contacts arranged in alignment, the connections being in desired firing order, the hood portion of said auto having a line of socket holes for receiving lamps, a row of lamps screwed into said socket holes, the socket holes being so located that the lower ends of the lamps then engage the aforementioned lamp contacts carried by the aforesaid insulation distributor plate, a conductor extending from the distributor shaft to an insulated contact at one end of the aforesaid battery housing, means for grounding the other terminal of the cell and thus closing the lamp circuit, and a resilient vibrator noise-making arm mounted on the aforesaid insulation plate and extending downward to engage the teeth of the aforesaid vibrator gear.

4. A toy racing auto comprising a battery housing for a flashlight cell, motor frame plates, an axle passing through said plates, a motor shaft carried by said plates, a train of gearing between said shafts, a distributor drive gear driven by said train, an upright distributor shaft carrying an insulated distributor gear meshing with the aforesaid distributor drive gear, a distributor arm carried by said distributor shaft, an insulation distributor plate disposed horizontally between the motor frame plates above the aforesaid gearing, said distributor plate having a ring of distributor contacts for engagement by said distributor arm, said distributor shaft being received in an insulation bearing at its lower end and by a bearing on the insulation distributor plate at its upper end, a series of lamp contacts mounted on top of said insulation plate and so shaped as to reach said distributor contacts, with the latter arranged in a circle and the lamp contacts arranged in alignment, the connections being in desired firing order, the hood portion of said auto having a line of socket holes for receiving lamps, a row of lamps screwed into said socket holes, the socket holes being so located that the lower ends of the lamps then engage the aforementioned lamp contacts carried by the aforesaid insulation distributor plate, a conductor extending from the upper bearing of the distributor shaft to an insulated contact at one end of the aforesaid battery housing, and means for grounding the other terminal of the cell and thus closing the lamp circuit.

5. A toy racing auto comprising a sheet metal base or chassis, a battery housing on said chassis, motor frame plates near the forward portion of said chassis, a front axle passing through said plates, a motor shaft carried by said plates, a train of gearing between said shafts, a distributor drive gear driven by said train, an upright distributor shaft carrying an insulation distributor gear meshing with the aforesaid distributor drive gear, a distributor arm carried by said distributor shaft, an insulation distributor plate disposed horizontally between the motor frame plates above the aforesaid gearing, said distributor plate having a ring of distributor contacts for engagement by said distributor arm, said distributor shaft being received in an insulation bearing at its lower end and by a bearing on the insulation distributor plate at its upper end, a series of lamp contacts mounted on said insulation plate and so shaped as to reach said distributor contacts, with the latter arranged in a circle and the lamp contacts arranged in alignment, the connections being in desired firing order, a sheet metal body adapted to be secured over said chassis to complete the toy auto, the hood portion of said body having a line of socket holes for receiving lamps, a row of lamps screwed into said socket holes, the socket holes being so located that the lower ends of the lamps then engage the aforementioned lamp contacts carried by the aforesaid insulation distributor plate, a conductor extending from the upper bearing of the distributor shaft to an insulated contact at one end of the aforesaid battery

housing, and means at the opposite end of the housing for optionally grounding the other end of the cell and thus closing the lamp circuit.

6. A toy racing auto comprising a sheet metal base or chassis, a battery housing on said chassis, motor frame plates near the forward portion of said chassis, a front axle passing through said plates, a motor shaft carried by said plates, a train of gearing between said shafts, a vibrator gear and a distributor drive gear driven by said train, an upright distributor shaft carrying an insulation distributor gear meshing with the aforesaid distributor drive gear, a distributor arm carried by said distributor shaft, an insulation distributor plate disposed horizontally between the motor frame plates above the aforesaid gearing, said distributor plate having a ring of distributor contacts for engagement by said distributor arm, said distributor shaft being received in an insulation bearing at its lower end and by a bearing on the insulation distributor plate at its upper end, a series of lamp contacts mounted on said insulation plate and so shaped as to reach said distributor contacts, with the latter arranged in a circle and the lamp contacts arranged in alignment, the connections being in desired firing order, a sheet metal body adapted to be secured over said chassis to complete the toy auto, the hood portion of said body having a line of socket holes for receiving lamps, a row of lamps screwed into said socket holes, the socket holes being so located that the lower ends of the lamps then engage the aforementioned lamp contacts carried by the aforesaid insulation distributor plate, a conductor extending from the upper bearing of the distributor shaft to an insulated contact at one end of the aforesaid battery housing, means at the opposite end of the housing for optionally grounding the other end of the cell and thus closing the lamp circuit, and a resilient vibrator noise-making arm mounted on the aforesaid insulation plate and extending downward to engage the teeth of the aforesaid vibrator gear.

7. A toy racing auto comprising a sheet metal chassis, a battery housing for a flashlight cell near the center portion of said chassis, motor frame plates near the forward portion of said chassis, a front axle passing through said plates, a high speed flywheel shaft carried by said plates, a train of step-up gearing between said shafts, a distributor drive gear driven by said train and having radial and axial teeth, an upright distributor shaft carrying a distributor gear in the form of a rubber disc meshing with the aforesaid radial and axial teeth, a distributor arm carried by said distributor shaft, an insulation distributor plate disposed horizontally between the motor frame plates above the aforesaid gearing, said distributor plate having a ring of distributor contacts for engagement by said distributor arm, said distributor shaft being received in an insulation bearing at its lower end and by a bearing on the insulation distributor plate at its upper end, a series of lamp contacts mounted on said insulation plate and so shaped as to reach said distributor contacts, with the latter arranged in a circle and the lamp contacts arranged in alignment, the connections being in desired firing order, a sheet metal body adapted to be secured over said chassis to complete the toy auto, the hood portion of said body being recessed to form a trough at the top and having a line of socket holes with the metal at each hold curved to act as a female thread for receiving the male thread of flashlight lamps, a row of red flashlight lamps screwed into said socket holes, the socket holes being so located that the lower ends of the lamps then engage the aforementioned lamp contacts carried by the aforesaid insulation distributor plate, a conductor extending from the upper bearing of the distributor shaft to an insulated contact at one end of the aforesaid battery housing, and a grounded cam-shaped switch and switch lever mounted on said chassis at the opposite end of the housing for optionally grounding the other end of the cell and thus closing the lamp circuit.

8. A toy racing auto comprising a body including a hood, an axle, gearing connected to said axle, said gearing including a distributor drive gear, an upright distributor shaft, a distributor arm carried by said distributor shaft, an insulation distributor plate disposed above the aforesaid gearing and below the top of said hood, said distributor plate having a ring of distributor contacts passing therethrough for engagement by said distributor arm, sheet metal lamp contacts on said insulation plate and so shaped as to connect with said distributor contacts, with the latter arranged in a circle on the lower face of the plate and the lamp contacts arranged in alignment longitudinally of the auto on the upper face of the plate, the hood of said auto having a line of socket holes for receiving lamps, a row of lamps in said socket holes, the socket holes being so located that the lower ends of the lamps then engage the aforementioned lamp contacts carried by the aforesaid plate, a holder for a battery cell, and conductors completing a circuit between said cell and said lamps through said distributor arm.

9. A toy auto as defined in claim 8, in which the distributor arm has a contact having an arcuate length which is a substantial part of the arcuate distance between the distributor contacts, whereby there is a relatively sustained illumination of one lamp or another as the auto runs.

10. A toy racing auto comprising a body including a hood, an axle, gearing connected to said axle, said gearing including a distributor drive gear, an upright distributor shaft, a distributor arm carried by said distributor shaft, an insulation distributor plate disposed above the aforesaid gearing and below the top of said hood, said distributor plate having a ring of distributor contacts passing therethrough for engagement by said distributor arm, sheet metal lamp contacts on said insulation plate and so shaped as to connect with said distributor contacts, with the latter arranged in a circle on the lower face of the plate and the lamp contacts arranged in alignment longitudinally of the auto on the upper face of the plate, the connections being in a desired firing order corresponding to that of a real engine, the hood of said auto having a line of socket holes for receiving lamps, a row of lamps in said socket holes, the socket holes being so located that the lower ends of the lamps then engage the aforementioned lamp contacts carried by the aforesaid plate, a holder for a battery cell, and conductors completing a circuit between said cell and said lamps through said distributor arm.

11. A toy racing auto comprising a body including a hood, an axle, gearing connected to said axle, said gearing including a distributor drive gear, an upright distributor shaft, a distributor arm carried by said distributor shaft, an insulation distributor plate disposed above the aforesaid gearing and below the top of said hood, said distributor plate having a ring of distributor contacts passing therethrough for engagement by said distributor arm, sheet metal lamp contacts on said insulation plate and so shaped as to connect with said distributor contacts, with the latter arranged in a circle on the lower face of the plate and the lamp contacts arranged in alignment longitudinally of the auto on the upper face of the plate, the hood of said auto having a line of socket holes for receiving lamps, a row of lamps in said socket holes, the hood being depressed at said line of socket holes to partially receive the lamps, the socket holes being so located that the lower ends of the lamps then engage the aforementioned lamp contacts carried by the aforesaid plate, a holder for a battery cell, and conductors completing a circuit between said cell and said lamps through said distributor arm.

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