United States Patent

[11] 3,574,267

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[21] Appl. No. **842,524**
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[45] Patented **Apr. 13, 1971**

[54] **WHEEL STAND TOY VEHICLE**
10 Claims, 5 Drawing Figs.

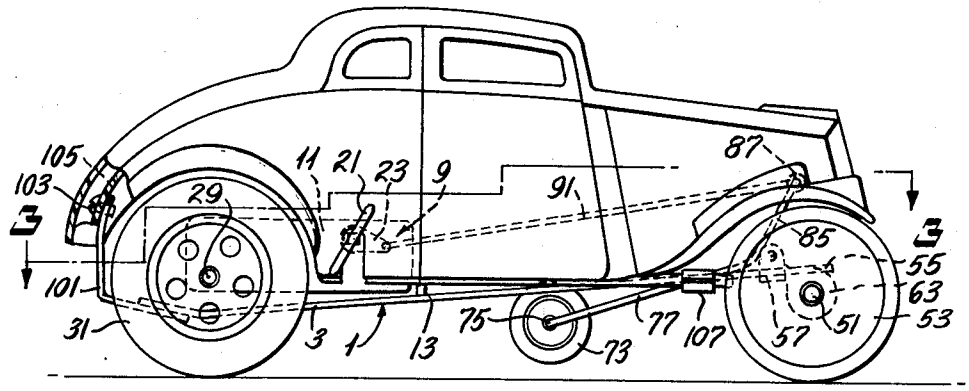
[52] **U.S. Cl.** **46/211**
[51] **Int. Cl.** **A63h 17/00**
[50] **Field of Search** 46/206, 211, 201, 202

[56] **References Cited**
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Assistant Examiner—J. Q. Lever
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ABSTRACT: The fifth wheel is periodically pivoted into and out of contact with the supporting surface for performing wheel stands during forward movement of the vehicle by a spring motor driven rotating crank and lever system. The front wheels of the vehicle are adjustably mounted on the side rails for changing the length of the wheel base to accommodate various body styles and models.



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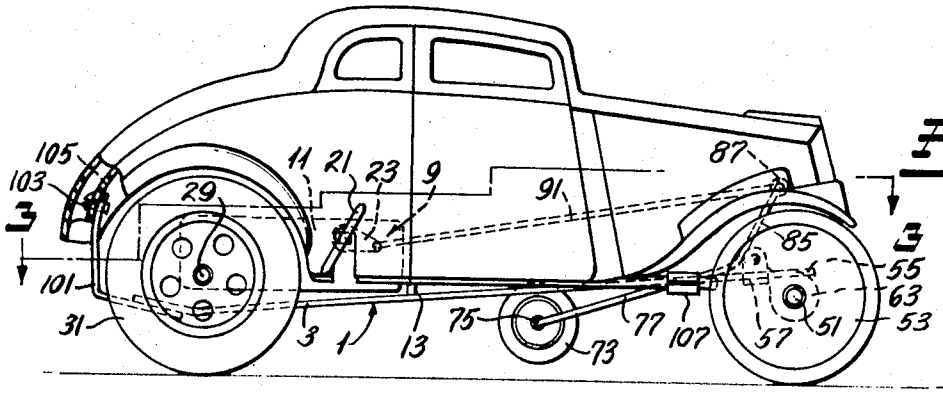


Fig. 1.

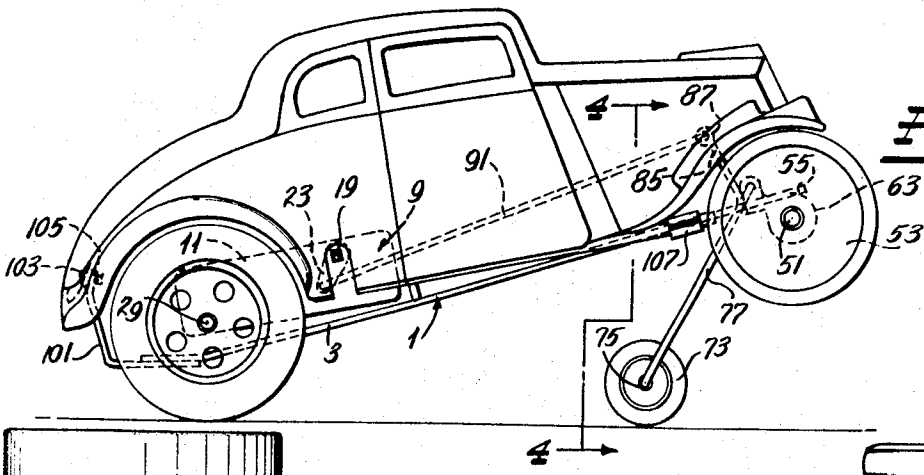


Fig. 2.

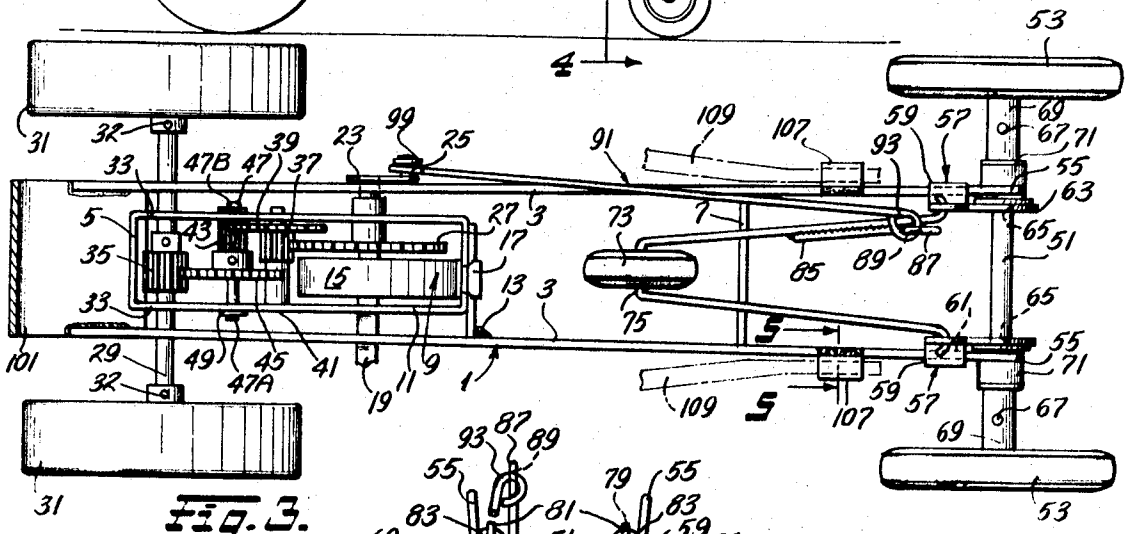


Fig. 3.

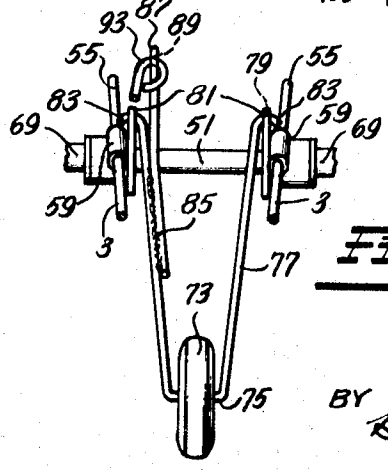


Fig. 4.

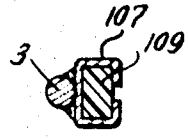


Fig. 5.

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WHEEL STAND TOY VEHICLE

BRIEF SUMMARY OF THE INVENTION

This invention relates to a novel toy vehicle chassis adapted to be installed within the body shell of scale model cars formed of lightweight materials, such as plastics, thereby activating these otherwise still models.

The power for rotating the drive wheels of the toy vehicle is furnished by a hand-wound spring motor. A rotating crank and lever system connected to the winding shaft of the spring motor periodically pivots a fifth wheel into and out of engagement with a supporting surface so that the toy vehicle performs wheel-stands from time to time as it is driven forward. Front axle mounts are adjustably connected to the side rails of the chassis or frame so that the wheelbase may be modified to fit various models of toy cars. The action imparted to the model toy vehicles by the present, universal type chassis, simulates the wheel-stands and throttle releases performed by conventional drag-racing automobiles.

It is an object of the invention to provide a chassis for toy model cars for animating them.

Another object of the invention is to provide a chassis for toy model cars which has an adjustable wheelbase for adapting the chassis to different models.

It is also an object to provide a chassis for toy model cars which simulates the wheel-stands and throttle releases of drag-racing vehicles.

A further object is to provide a universal, wheel-stand chassis for toy model vehicles which is relatively inexpensive to manufacture, includes relatively few moving parts, is readily assembled in a toy model vehicle body, is strongly constructed and not likely to get out of order.

These and other objects of the invention will be more fully understood when considered with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view of a wheel-stand toy automobile of the present invention with the standing wheel in inoperative position;

FIG. 2 is a side elevational view, similar to FIG. 1, showing the standing wheel in operative position;

FIG. 3 is an enlarged horizontal view with the automobile body removed from the chassis for purposes of clarity, taken on the line 3–3 of FIG. 1, a portion of the body being shown in phantom lines;

FIG. 4 is a fragmentary vertical sectional view, taken on the line 4–4 of FIG. 3, showing a portion of the standing wheel linkage; and

FIG. 5 is an enlarged vertical sectional view taken on the line 5–5 of FIG. 4 showing the connection between the chassis and the body of a toy automobile. SPECIFICATION

The chassis 1 is preferably formed of wire and includes longitudinally extending side rails 3 connected together at the rear of the chassis by a sheet metal support 101 and connected together adjacent the front end of the vehicle but spaced a substantial distance therefrom by a wire crossmember 7.

A manually wound spring motor 9 is mounted on the side rails 3 adjacent the rear end of the vehicle. The motor 9 includes a frame 11 which carries at the forward end thereof a brace 13 soldered or otherwise fixedly secured to the adjacent side rail 3.

The spring motor 9 may be of conventional construction and includes a coil spring 15 fastened at its outer end 17 to the forward end 17 of the frame 11. The inner end of the spring 15 is fastened to a winding shaft 19 which extends through the central portion of the spring 15 and projects outwardly at both ends thereof beyond the side rails 3. One end of the winding shaft 19 carries a conventional T-shaped key head 21 for manually winding the spring, while the other end of the winding shaft has a crank 23 and eccentric throw 25 fixed thereto for rotation therewith. Also fixed to the winding shaft 19 for rotation therewith is a driving gear 27 located within the frame 11.

The rear axle 29 of the vehicle carries the driving wheels 31 adjustably fixed to the outer ends thereof by setscrews 32 and is rotatably mounted in aligned openings formed in the sidewalls 33 adjacent the rear wall of the frame 11. A driven gear 35 is fixed to the rear axle 29 for rotation therewith and is disposed between the sidewalls 33 of the frame 11.

The drive gear 27 is operably connected with the driven gear 35 by reduction gearing which includes gears 37 and 39 fixed for rotation with the shaft 41 rotatably mounted in aligned openings in the sidewalls 33 of the motor frame 11 and gears 43 and 45 fixed on the shaft 47 for rotation therewith, the shaft 47 also being mounted in suitable aligned openings in the sidewalls 33. As shown, gear 27 meshes shaft gear 37, 39 with 43 and 45 with 35. As is conventional in manually wound spring motors of the type illustrated, the shaft 41 is mounted in the sidewalls 33 in elongated openings which permit the gear 39 to be moved out of engagement with the gear 43 during manual winding of the spring 15. The spring motor also includes a conventional manual control lever 49 pivotally mounted on the outer surface of a sidewall 33 of the frame 11. The lever 49 has at its lower end a forked portion engageable with the outer end 47A of the shaft 47 for pivoting the shaft in the elongated opening in which it rotates, about the end 47B thereof for disengaging the gear 45 from the gear 35 and at the same time tilting or canting the gear 43 with respect the the gear 39 so as to bind gears 43 and 39 against rotation and thus prevent the spring 15 from unwinding.

The front axle 51 carries wheels 53 fixed thereto at either end thereof. The front axle 51 is adjustably mounted longitudinally of the vehicle on the portion of the side rails 3 disposed between the cross frame member 7 and the forward free ends 55 of the side rails 3. A front axle support bracket 57 is adjustably mounted on the forward portion of each of the side rails 3 and each bracket includes a sleeve portion 59 provided with an opening 61 in which the forward portion of the corresponding side rail 3 is adjustably secured. The brackets 57 may be secured in adjusted position on the side rails 3 by means of solder of suitable strong adhesive. Since the brackets 57 are formed of lightweight sheet metal, they may be deformed, as by squeezing with a suitable tool, for locking them in adjusted position on the side rails 3.

The brackets 57 each include a flange portion 63 having a transverse opening 65 extending therethrough in a direction normal to the opening 61 provided in the sleeve portion 59. As shown, the front axle 51 extends through and is rotatably mounted in the aligned openings 65, the wheels 53 being secured to the axle by setscrews 67 mounted in threaded openings in the tubular extensions 69 which extend inwardly from the inner surface of each wheel coaxial with the wheel axis. Suitable spacing elements 71 are mounted on the axle between the tubular extensions 69 and the flange portion 63 of the brackets 57 in order to space the wheels 53 the required distance apart for accommodating the chassis to the toy vehicle body to be mounted thereon. Thus it will be seen that by adjusting the brackets 57 longitudinally on the side rails 3 that the wheelbase of the vehicle, that is the distance between the front axle and the rear axle, may be adjusted to suit the wheelbase of the toy vehicle body to be mounted thereon and that the gauge or distance between the front wheels and the distance between the rear wheels may be suitably adjusted to accommodate different models of toy vehicle bodies.

A fifth wheel, or standing wheel, 73 is rotatably mounted on an axle portion 75 of a generally V-shaped arm arrangement 77 which is pivotally mounted in openings 79 formed in sheet metal bearing supports 81 fixedly secured as by soldering to each of the side rails 3 adjacent the forward end of the chassis. The arm arrangement 77 is formed of wire and includes a pair of arms which diverge from the axle portion 75 to the free ends where they are bent outwardly as at 83 and pivotally mounted in the openings 79 formed in the bearing supports 81. A lever 85 soldered or otherwise fixedly secured to one of the arms adjacent its pivotal mounting extends outwardly from the arm in the manner of a bellcrank. The outer end 87 of the lever 85 is formed with an opening 89 and one end of a wire

connecting rod **91** extends through the opening **87** and is formed into a loop **93** providing a pivotal connection between the end of the connecting rod **91** and the end of the lever **85**. The other end of the connecting rod **91** encircles the eccentric throw **25** of the crank **23** to provide a rotatable connecting rod bearing. A washer **99** carried by the outer end of the eccentric throw **25** maintains the connecting rod **91** in position.

The V-shaped arm arrangement **77** is pivotally mounted on the side rails **3** in such a manner that the fifth wheel **73** engages the supporting surface forward of the center of gravity of the chassis or of the chassis with the vehicle body mounted thereon. The axle **75** is parallel with the rear axle **29** so that the vehicle travels straight ahead at all times.

In order to mount a toy vehicle body on the chassis, a sheet metal support **101** is soldered to the rear end of the chassis side rails **3** and extends a short distance rearwardly and then upwardly to a position where a fastener such as a threaded screw **103** may pass through an opening formed in the rear portion of the toy vehicle body and into a threaded opening **105** formed in the upper end of the sheet metal support **101**. The forward end of the toy vehicle body may be secured to the side rails **3** adjacent the forward end of the chassis by means of malleable sheet metal clips **107** soldered or otherwise adjustably secured in position on each of the side rails **3**. The clips **107** may be bent or formed to engage and hold side body members **109**.

In operation, after the spring motor has been manually wound and the vehicle chassis placed on a smooth hard surface, the manual control lever **49** is released so that the spring motor drives the rear wheels **31** of the vehicle and it moves in a forward direction. As the spring unwinds, the winding shaft **19** rotates and with it also rotates the crank **23** resulting in reciprocations of the connecting rod **91** and repeated gradual pivotal movement of the arm **77** and fifth wheel **73** between the position shown in FIG. **1** where the fifth wheel is out of engagement with the supporting surface and position shown in FIG. **2** where the fifth wheel is in engagement with the supporting surface and the front wheels of the vehicle have been raised. With the gearing arrangement disclosed, the front wheels of the vehicle are gradually raised and lowered a number of times for each winding of the spring motor and the vehicle simulates several of the power wheel-stands and throttle releases of drag strip vehicle as it is driven forward.

I claim:

1. In a chassis for a wheel-stand toy vehicle, a spring motor mounted on the chassis for driving the rear wheels thereof; a fifth wheel movable between a retracted position out of engagement with a supporting surface and a projected position in engagement with a supporting surface; pivoted arm means; means rotatably mounted the fifth wheel on one end of the arm means; means pivotally mounting the other end of the arm means on the vehicle chassis forward of the center of gravity of the vehicle; a lever rigidly fixed at one end thereof to the arm means and extending outwardly therefrom, a rotating crank operably connected with the spring motor for rotation therewith; and a connecting rod rotatably connected at one end thereof to the crank and pivotally connected at the other end thereof to the outer end of the lever for moving the fifth wheel between the retracted and the projected positions as the vehicle is being driven forward by the spring motor.

2. A chassis for a wheel-stand toy vehicle according to claim **1** in which the rotating crank is connected to the winding shaft of the spring motor.

3. A chassis for a wheel-stand toy vehicle according to claim **2** in which the spring motor is mounted adjacent to rear end of the vehicle, the arm means is pivotally mounted closely adjacent the front end of the vehicle, and means provided for mounting the vehicle front axle on the forward portion of the chassis in adjusted position longitudinally thereof.

4. A chassis for a wheel-stand toy vehicle according to claim **3** in which the vehicle side rails are formed of wire, and the means adjustably mounting the vehicle front axle comprises a bracket having a first opening therein embracing each of the side rails, and a transverse opening therein mounting the vehicle front axle therein.

5. A chassis for a wheel-stand toy vehicle according to claim **4** in which said arm means is formed of wire and is of generally V-shaped configuration, said other end of the arm means is the free ends of the V-shaped wire, one free end of the wire being pivotally mounted on each of the side rails.

6. A chassis for a wheel-stand toy vehicle according to claim **2** in which the spring motor includes reduction gearing between the winding shaft thereof and the drive connection with the vehicle wheels, the driving wheels of the vehicle being rotated a plurality of times for each single rotation of the crank whereby the vehicle travels a substantial distance in the driven direction between each wheel-stand.

7. In a chassis for wheel-stand toy vehicle powered by a spring motor and having a pair of substantially parallel side rail members, a front axle support means adjustably mounted on each of the front rails adjacent the front end thereof for movement longitudinally thereof for securing the front axle of the vehicle in adjusted position relative to the rear axle thereof, and means securing the front axle support means in adjusted position.

8. In a chassis for a wheel-stand toy vehicle according to claim **7** in which the side rails are formed of wire and the front axle support means each comprises a bracket having a first opening formed therein mounting the vehicle front axle, and a transverse opening therein embracing a side rail.

9. In a chassis for a wheel-stand toy vehicle according to claim **9** in which the bracket includes an integral sleeve in which the transverse opening is formed and the sleeves are soldered in adjusted position to the side rails.

10. In a chassis for a wheel-stand vehicle according to claim **1** wherein means is carried by the chassis for supporting a toy vehicle body thereon.

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,574,267 Dated April 13, 1971

Inventor(s) LOUIS O. SCHORSCH

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

IN THE SPECIFICATION

Column 2, line 13, change "shaft" to --with--;

line 25, change "the", second occurrence, to --to-

line 38, change "of", second occurrence, to --or--

IN THE CLAIMS

Claim 1, line 6, change "mounted" to --mounting--;

Claim 9, line 2, change "9" to --8--.

Signed and sealed this 24th day of August 1971.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents