

July 29, 1941.

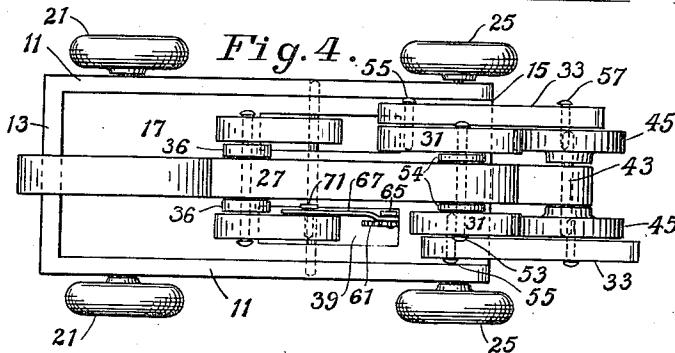
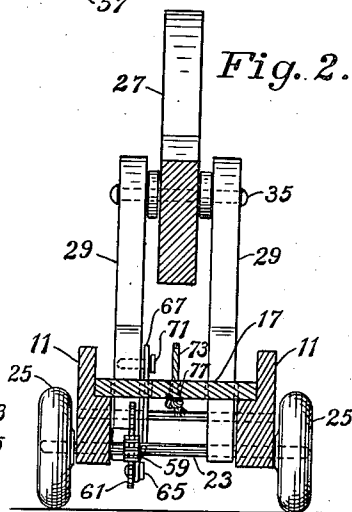
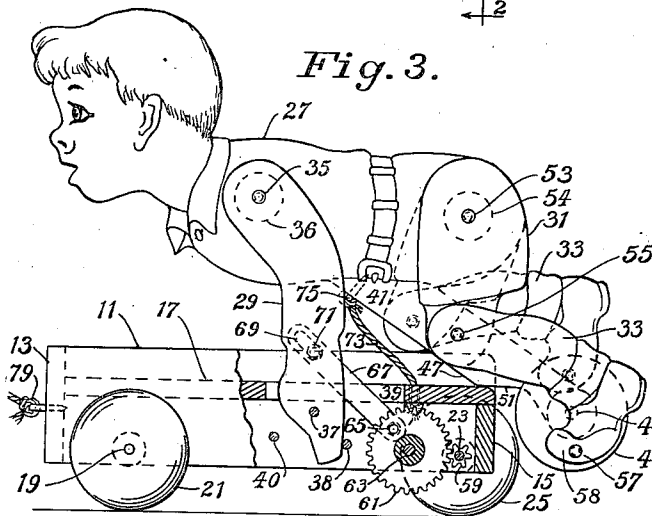
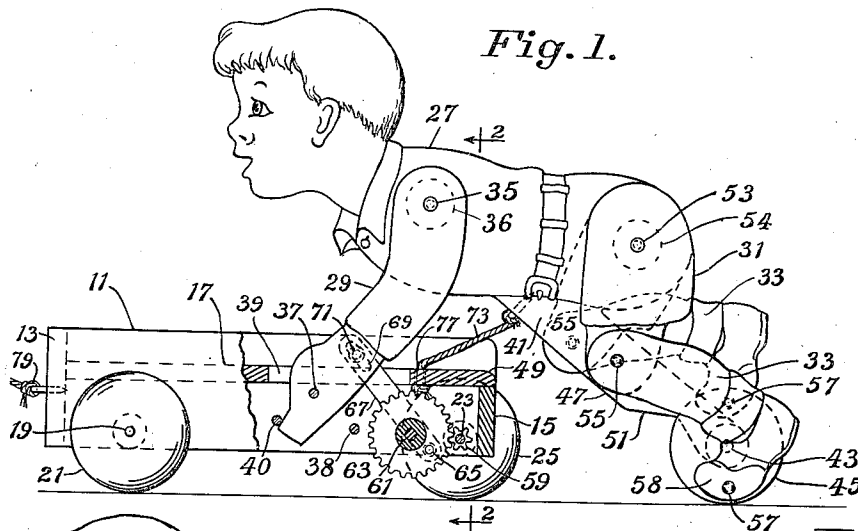
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2,251,006

WHEELED FIGURE TOY

Filed March 10, 1941

2 Sheets-Sheet 1



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WHEELED FIGURE TOY

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2 Sheets-Sheet 2

Fig. 5.

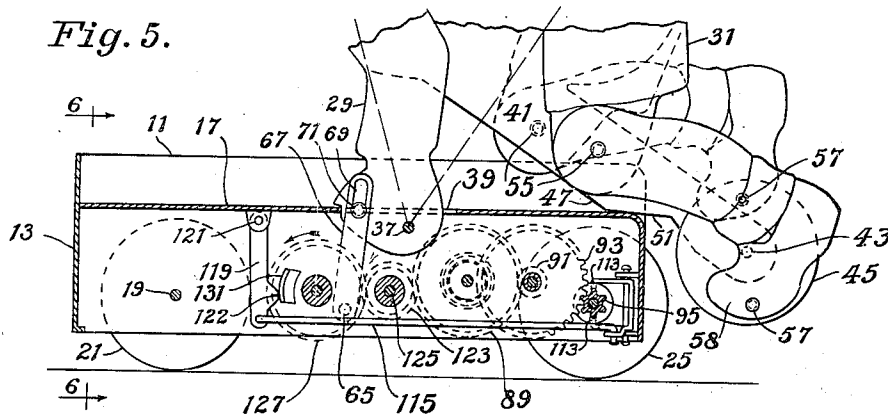


Fig. 6.

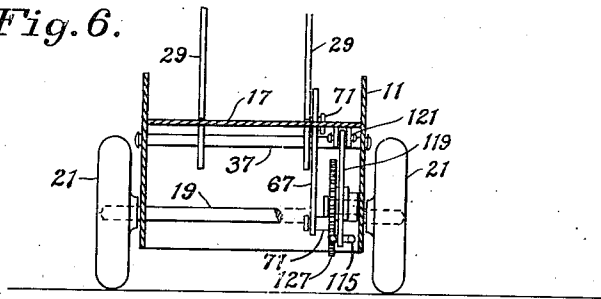
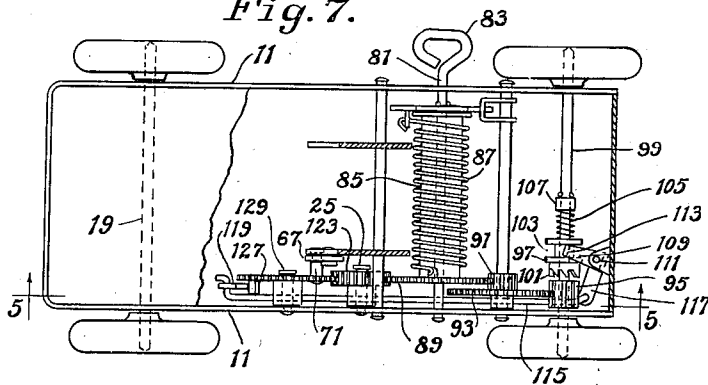


Fig. 7.



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2,251,006

WHEELED FIGURE TOY

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9 Claims. (Cl. 46—107)

The present invention relates to a wheeled figure toy in which a jointed toy figure is pivotally attached to a wheeled vehicle, the toy figure being mechanically caused to move in simulation of movements of the living subject, and an object of the invention is the provision of an improved and more interesting and entertaining toy of this character.

Another object is to cause the figure, when the vehicle is made to move along, to appear to alternately run behind pushing the vehicle forward, or to get up and ride thereon.

Another object is the provision of a figure having jointed legs pivotally connected to wheels at the feet, which wheels are intermittently rotated through intermittent contact with the supporting surface, and which rotation causes the figure to appear to run intermittently or to remain immovable on the vehicle.

A still further object is the provision of a self propelled figure toy embodying the before mentioned objects in combination with means for momentarily and intermittently stopping and restarting the forward travel of the vehicle, and for causing the figure, while the vehicle is stopped, to move partially off of said vehicle and to assume its running position, whereupon the restarting and succeeding forward movement of the vehicle appears to be caused by the life-like action of the figure, which, after the vehicle is under way, climbs up and rides thereon.

To these and other ends the invention resides in certain improvements and combination of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Fig. 1 is a side view with the toy figure in extreme rear position, of a toy in accordance with one embodiment of the invention.

Fig. 2 is a vertical section on the line 2—2 of Fig. 1.

Fig. 3 is a side view similar to Fig. 1, the toy figure being here shown in extreme forward position.

Fig. 4 is a plan view with the toy figure in the position shown in Fig. 3.

Fig. 5 is a side view of a toy in accordance with another embodiment of the invention, with the vehicle shown in vertical section taken on the line 5—5 of Fig. 7, and with the upper portion of the toy figure broken away.

Fig. 6 is a vertical section on line 6—6 of Fig. 5 with parts removed.

Fig. 7 is a plan view of the vehicle shown in

Figs. 5 and 6, with most of the platform portion broken away to expose the operating mechanism.

The same reference numerals throughout the several views indicate the same parts.

The drawings show two embodiments of the invention, Figs. 1, 2, 3 and 4 illustrate a pull toy which is here shown as constructed mainly of wood, while Figs. 5, 6 and 7 show a mechanical toy constructed mainly of sheet metal and driven by a spring motor.

In the former embodiment of the invention a vehicle, here shown in the form of a child's wagon, comprises the side boards 11, front board 13, rear board 15, platform 17, front axle 19, front wheels 21, rear axle 23 and rear wheels 25. A jointed toy figure, representing a small boy, comprises the one piece head and body member 27, arms 29, upper leg members 31 and lower leg members 33. The arm members 29 are loosely pivoted, adjacent their upper ends, to the body member 27 by the pin 35 which preferably fits tightly in the arm members and loosely in the body member. Washers 36 serve to maintain the proper spacing on each side between the arm members and the body member. The arm members 29 are also pivoted to turn freely upon the rod 37, the rod being tight in holes in the wagon sides 11. Similar rods 38 and 40 are disposed parallel to the rod 37 and serve as stops to limit the angular movement of the arm members 29.

The platform 17 is provided with elongated apertures 39 through which the arm members extend, permitting free movement of said arm members throughout the operative angle. The body member 27 is formed with a downwardly and rearwardly sloping extension 41. This extension carries at its lower end a free fitting bearing for an axle 43, to each end of which wheels 45 are tightly fitted. The body extension 41 is formed with a sloping edge 47 which extends downwardly and rearwardly and terminates at the short horizontal edge 51.

The upper leg members 31 are freely pivoted to the body 27 by pins 53 with positioning washers 54 between the leg members and the body. The lower leg members 33 are pivoted freely to the lower ends of the upper leg members 31 by pins 55 thus providing a jointed knee action. The pins 57 extend laterally from the faces of the wheels 45 adjacent the wheel perimeters, and serve as crank pins connecting the foot ends 58 of the lower leg members 33 to the wheels 25. These pins 57 are preferably positioned relatively on the wheels 45 at points diametrically opposite to each other.

A pinion 59, fixed on the rear axle 23, meshes with a gear 61 which turns on the stud 63. The gear 61 carries a crank pin 65 to which is connected one end of a link 67. The other end of the link is slotted as shown at 69 and fits freely on the pin 71 which projects laterally from one of the arms 29. A cord 73 is attached at one end to the body member 27 at 75 and at the other end to the platform 17 at 77. A pull string is attached to the front of the wagon at 79.

The operation of this embodiment of the invention is as follows:

When the toy is pulled along a supporting surface, rotation of the pinion 59 turns the gear 61 at a comparatively slow speed and the pin 65 slowly reciprocates the link 67 which, by engagement with the pin 71, imparts oscillatory movement to the arms 29. This movement of the arms 29 causes the toy figure to reciprocate alternately forward and backward in relation to the wagon body. Starting from the position shown in Fig. 1, when the toy is pulled along, the wheels 45, being in contact with the supporting surface, will be caused to rotate and will impart, through the pin connections 57 and 55, reciprocal motions to the lower leg members 33 and oscillatory motion to the upper leg members 31, which motions combine to realistically simulate an actual child's running motions while pushing a wagon. This running movement of the legs and feet will continue so long as the wagon is in motion and the wheels 45 are in contact with the supporting surface. As the gear 61 turns from the position shown in Fig. 1, the link 67 moves upwardly, guided by the pin 71 through the slot 69. When the lower end of the slot 69 makes contact with the pin 71 continued upward movement of the link causes the arms 29 to move angularly forward about the pivot rod 37 and thereby, through the connecting pin 35, the whole toy figure is drawn forward relatively to the wagon body. Near the limit of this forward motion of the toy figure the sloping edge 47 contacts the rounded corner 49 at the rear of the wagon platform and slides upwardly thereon, causing the whole rear portion of the toy figure to move upwardly as it is drawn further forward, until the horizontal edge 51 is drawn onto the rear end of the platform 17 where it remains stationary, as shown in Fig. 3, until forced backward therefrom.

Obviously the moment the wheels 45 are raised from contact with the supporting surface they cease to rotate and the leg motions, or running action, stops so that there is no leg motion while the toy figure is riding on the wagon. It is desired that the toy figure remain in its extreme forward, or riding position, as shown in Fig. 3, for a sufficient interval of time to make the action quite realistic, rather than to be immediately pulled therefrom. This desired dwell of the figure in the riding position is accomplished by the slotted connection 69 of the link 67 to the pin 71, which permits some downward movement or return travel of the link 67 before the upper end of the slot makes contact with the pin 71 and thereafter draws the figure back again, off of the wagon and to the running position. In like manner the slot 69 provides a dwell of the figure, in relation to the wagon, while in its running position. The figure will continue to perform this sequence of movements, alternately running and riding, so long as the toy is pulled or moved along on a supporting surface. The purpose of the cord 73 is to limit upward angular movement of the rear portion of the toy figure about the arm

pivots 35 in the event the rear portion of the figure is grasped and the toy lifted thereby. This cord 73 may be dispensed with if desired for it is not essential to the satisfactory operation of the toy.

Figs. 5, 6 and 7 illustrate another embodiment of the invention which differs from that described in the foregoing in that the toy is self propelled, in this case by a spring motor, and that the wagon may be caused to intermittently stop and start again during its travel along the supporting surface, while the motor continues to run until the spring is unwound. The toy figure is operated by the motor, independently of the wagon driving means, and causes said toy figure to perform as before described. The stopping and starting of the wagon will occur at regular intervals at a predetermined point in the cycle of operations to produce the desired realistic effects.

In Figs. 5, 6 and 7 the toy figure is not shown in full, only the lower portion of said figure being shown in Fig. 5, and only the lower parts of the toy figure arms being shown in Figs. 6 and 7. The toy figure of this embodiment of the invention is essentially the same in construction and performance as that described in the foregoing and therefore its description will not be here repeated. The same reference numerals are used in Figs. 5, 6 and 7 for parts which correspond to similar parts shown in Figs. 1, 2, 3 and 4. Any suitable type of spring motor may be employed. A common type of motor is here shown concealed within the wagon body under the platform 17. The motor proper comprises the winding shaft 81, winding key 83, cylinder 85, drive spring 87, main drive gear 89, pinion 91, gear 93, and pinion 95, which pinion is fitted freely on the axle 99. The motor is preferably provided with some suitable type of governing or speed controlling means, but to avoid complexity of the drawings such governing means is not here shown. A clutch member 97 is carried by the axle 99 and is fitted to slide freely thereon longitudinally thereof, but is spline connected or otherwise fitted to drive said axle rotationally when said clutch member is caused to rotate. Beveled and pointed clutch teeth 101 are carried by and project horizontally from one face of the clutch member 97 and are adapted to drivingly interlock with the teeth ends of the pinion 59 when said clutch member is moved longitudinally thereagainst. The clutch member 97 is also provided with an annular groove 103 for engagement with clutch shifting means. A helical compression spring 105 encircles the axle with one end abutting a fixed collar 107 and the other end pressing against the adjacent end of the clutch member 97.

A bell crank 109 is pivoted on the pin 111 and is formed with horizontal upper and lower arms which carry at their ends the shifting prongs 113, which prongs project into the clutch groove 103 at points substantially above and below the center line of the axle. A rod 115 is positioned horizontally between the gear train and the adjacent wagon side and is operatively connected at its rearward end to a hole in the end of the bell crank arm 117 and is similarly connected at its forward end to the lower end of the depending lever arm 119. Said lever arm 119 is pivoted at its upper end at 121 providing for forward and backward swinging movement thereof. The lever arm 119 is formed with a rearwardly projecting tapered nib at 122.

A gear 123 meshes with the drive gear 89 and turns freely on the stud bearing 125. A gear 127

meshes with the gear 123 and turns on the stud bearing 129. This gear 127 carries the crank pin 65 and the arcuate cam segment 131 which projects laterally from the face of the gear at right angles thereto. The link 67 connects at its lower end to the crank pin 65 and its slotted upper end engages with the pin 71 which projects from the arm 29.

In operation this embodiment of the invention is as follows:

When the spring motor is wound the pinion 95 will be rotated and if the clutch 99 is in the driving position, with the teeth 101 in engagement with the pinion 95, the axle 99 and wheels 25 will rotate, causing the wagon to travel along the supporting surface. As the gear 89 rotates it drives the intermediate gear 123 and thereby rotates the gear 127 in the direction indicated by the arrow. Revolution of the crank pin 65, carried by the gear 127, will reciprocate the link 67 and, through the pin 71, will impart oscillatory motion to the arms 29, causing the toy figure to perform as previously described. Obviously this action will continue so long as the motor runs, whether the wagon is moving along or standing still. As the gear 127 rotates the cam segment 131 will revolve and when the leading edge of the cam contacts the tapered edge of the nib 122, which nib normally projects into the path of the cam, the lever arm 119 will be made to swing forwardly to the position shown in Figs. 5 and 7. The lever arm 119 in moving forward pulls the rod 115 and the bell crank lever 117 forward, and thereby the prongs 113 of the bell crank will force the clutch member 97 longitudinally along the axle 99 against the pressure of the spring 105, and out of engagement with the pinion 99. As soon as the clutch is disengaged from the pinion 95 no further propelling force is being applied to the axle and the wagon will come to a stop, although the spring motor continues to run and the pinion 95 continues to rotate. Disengagement of the clutch and the force required to hold the clutch member in the disengaged position against the pressure of the spring 105, which is the position shown in Fig. 7, will produce considerable friction between the shifting prongs 113 and the side of the clutch groove 103 nearest to the spring 105. This friction is advantageous in that it acts as a brake to stop further travel of the wagon due to momentum, for, to obtain the desired effect, it is preferred that the wagon stop quickly when the clutch is thrown out.

The crank pin 65 and the cam segment 131 are so positioned relatively to each other on the gear 127, that the moment the cam has thrown the lever 119 forward resulting in disengagement of the clutch and stopping the wagon travel, the link 67 will have moved up to the point where the bottom of the slot 69 makes contact with the pin 71, which is the position in Fig. 5, and the toy figure will begin its backward movement off of the wagon to its running position. When the toy figure reaches its rear-most position the cam 131 has then revolved far enough to disengage the nib 122, releasing the lever 119, and permitting the spring 105 to return the clutch 99 to its driving position, thus causing the wagon to again start to travel along the supporting surface. Immediately the wagon starts to move forward the wheels 45 of the toy figure start to rotate and to actuate the leg members to simulate running action.

The effect of the sequence of movements above

described is to give the impression that when the wagon stops the boy dismounts therefrom, starts to push the wagon forward and, when sufficient speed is attained, climbs on again and rides until the wagon again stops. This performance will be repeated at regular intervals until the motor drive spring is unwound.

While certain embodiments of the invention have been disclosed, it is to be understood that the inventive idea may be carried out in a number of ways. This application is therefore not to be limited to the precise details described, but is intended to cover all variations and modifications thereof falling within the scope of the appended claims.

I claim:

1. A figure toy including a vehicle movable over a supporting surface, a figure connected to said vehicle, said figure including a body portion, wheel means pivoted to said body portion in position to run on said supporting surface, a jointed leg pivotally secured to said body portion and to said wheel means, and means operating in timed relation to movement of said vehicle over said supporting surface for intermittently shifting said figure with respect to said vehicle to lift said wheel means intermittently from said supporting surface and then to lower said wheel means onto said supporting surface.

2. A figure toy including a vehicle movable over a supporting surface, a figure connected to said vehicle, said figure including a body portion and wheel means pivoted to said body portion, and means operating in timed relation to movements of said vehicle over said supporting surface for intermittently shifting said figure with respect to said vehicle to lift said wheel means intermittently from said supporting surface so that said figure is carried entirely by said vehicle, and then to lower said wheel means onto said supporting surface so that said figure is carried partly by said wheel means.

3. A figure toy including a vehicle movable over a supporting surface, a figure including a body portion having its axis arranged approximately horizontally and having an extension extending downwardly and rearwardly from said body portion, wheel means rotatably mounted on said extension, a jointed leg pivoted both to said body portion and to said wheel means, and means operating in timed relation to movements of said vehicle over said supporting surface for intermittently shifting said figure with respect to said vehicle to lift said wheel means intermittently from said supporting surface and then to lower said wheel means onto said supporting surface.

4. A figure toy including a vehicle movable over a supporting surface, a figure having a body portion, an arm pivotally secured to said body portion and to said vehicle, an extension extending in a downward and rearward direction from said body portion, wheel means rotatably mounted on said extension near the lower rear end thereof, a jointed leg pivotally connected to said body portion and to said wheel means, and means operating in timed relation to movements of said vehicle along said supporting surface for intermittently drawing said figure forwardly with respect to said vehicle, to cause said extension to ride up the rear edge of said vehicle and thereby to lift said wheel means off of said supporting surface, and for causing said figure to move rearwardly with respect to

said vehicle, to lower said wheel means into contact with said supporting surface so that movement of said vehicle and said figure along said supporting surface will turn said wheel means and thereby operate said jointed leg.

5. A figure toy including a vehicle movable over a supporting surface, a figure having a body and an arm pivoted both to said body and to said vehicle, rotary means mounted on said vehicle and turning in timed relation to movement of said vehicle over said surface, and means including a link having a lost-motion slot therein for operatively connecting said arm to said rotary means to cause said arm to move intermittently in timed relation to said rotary means, and to remain stationary relatively to said vehicle for a substantial time between successive intermittent movements.

6. A toy including a vehicle having a wheel for travel over a supporting surface, a rotary member rotating with said wheel, an arm pivotally connected to said vehicle and extending upwardly therefrom, a link operatively connecting said rotary member to said arm to oscillate said arm from the rotation of said rotary member, a figure at least partly overlying said vehicle and having an inclined cam surface faced downwardly to ride on a portion of said vehicle, and a pivotal connection between said arm and said figure, to cause said figure to move forwardly and backwardly as said arm is oscillated and to cause said cam surface to raise and lower said figure concomitantly with the forward and backward movements thereof.

7. A toy including a vehicle having a wheel for travel over a supporting surface, a rotary member rotating with said wheel, an arm pivotally connected to said vehicle and extending upwardly therefrom, a link operatively connecting said rotary member to said arm to oscillate said arm from the rotation of said rotary member, a figure having a body at least partly overlying said vehicle and an extension having an inclined cam surface faced downwardly to cooperate with a portion of said vehicle, a wheel rotatably mounted on said extension of said body, a jointed leg pivotally connected to said wheel

and to said body, and a connection between said arm and said body to cause said figure to move forwardly and backwardly as said arm is oscillated and to cause said cam surface to raise said wheel off of said supporting surface and to lower said wheel onto said supporting surface concomitantly with the forward and backward movements of said figure.

8. A figure toy including a figure having a body portion corresponding in general to the trunk of the figure, an extension on said body extending to the general vicinity of the feet of the figure, a pair of wheels pivotally mounted on opposite sides of said extension, a pair of thigh members pivotally connected to opposite sides of said body adjacent the hip region thereof, a pair of combined leg and foot members pivotally connected at their knee regions to said thigh members and pivotally connected at their feet to said wheels, a pair of arm members pivotally connected to said body adjacent the shoulder region thereof, a toy vehicle, and a pivotal connection between said arm members and said vehicle, to support said figure in part from said vehicle.

9. A figure toy including a figure having a body portion corresponding in general to the trunk of the figure, an extension on said body extending to the general vicinity of the feet of the figure, a pair of wheels pivotally mounted on opposite sides of said extension, a pair of thigh members pivotally connected to opposite sides of said body adjacent the hip region thereof, a pair of combined leg and foot members pivotally connected at their knee regions to said thigh members and pivotally connected at their feet to said wheels, a pair of arm members pivotally connected to said body adjacent the shoulder region thereof, a toy vehicle adapted to travel on a supporting surface, a pivotal connection between said arm members and said vehicle, and means carried by said vehicle and operating in timed relation to travel of said vehicle for oscillating one of said arms to cause said figure to move back and forth with respect to said vehicle.

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