March 25, 1941. A. J. MIDDLER 2,236,196

TOY VEHICLE

Filed Jan. 30, 1939 2 Sheets-Sheet 1

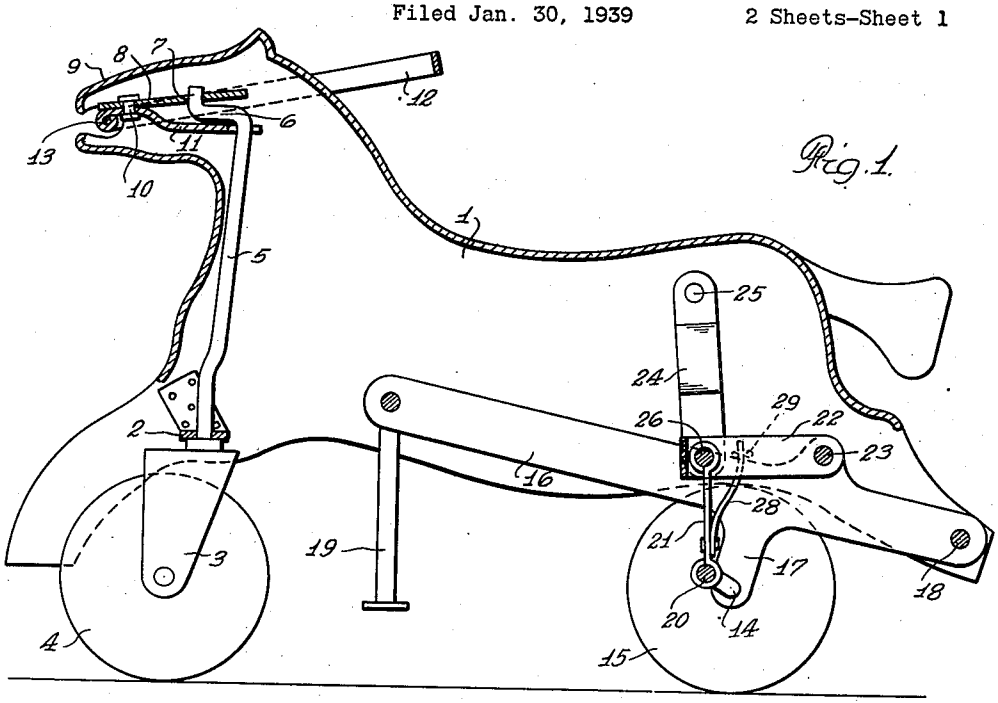


Fig. 1.

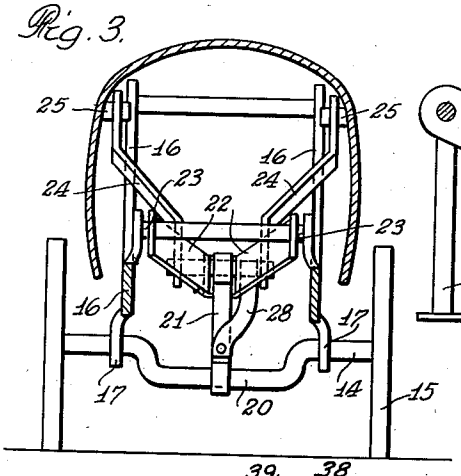


Fig. 3.

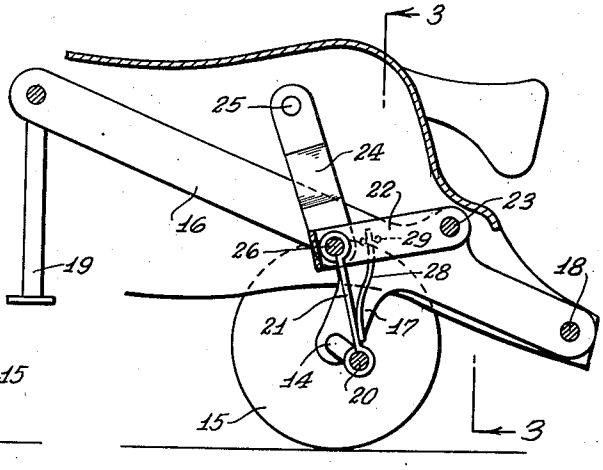


Fig. 2.

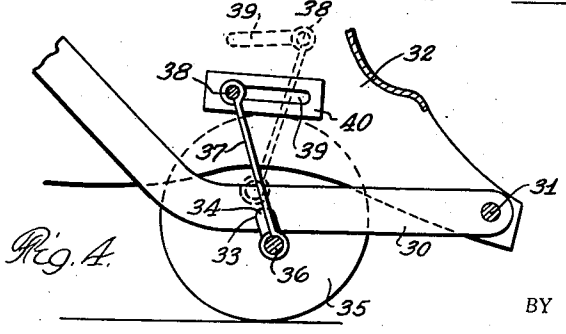


Fig. 4.

INVENTOR.
Alexander J. Middler
BY
ATTORNEY.

March 25, 1941. A. J. MIDDLER 2,236,196

TOY VEHICLE

Filed Jan. 30, 1939 2 Sheets-Sheet 2

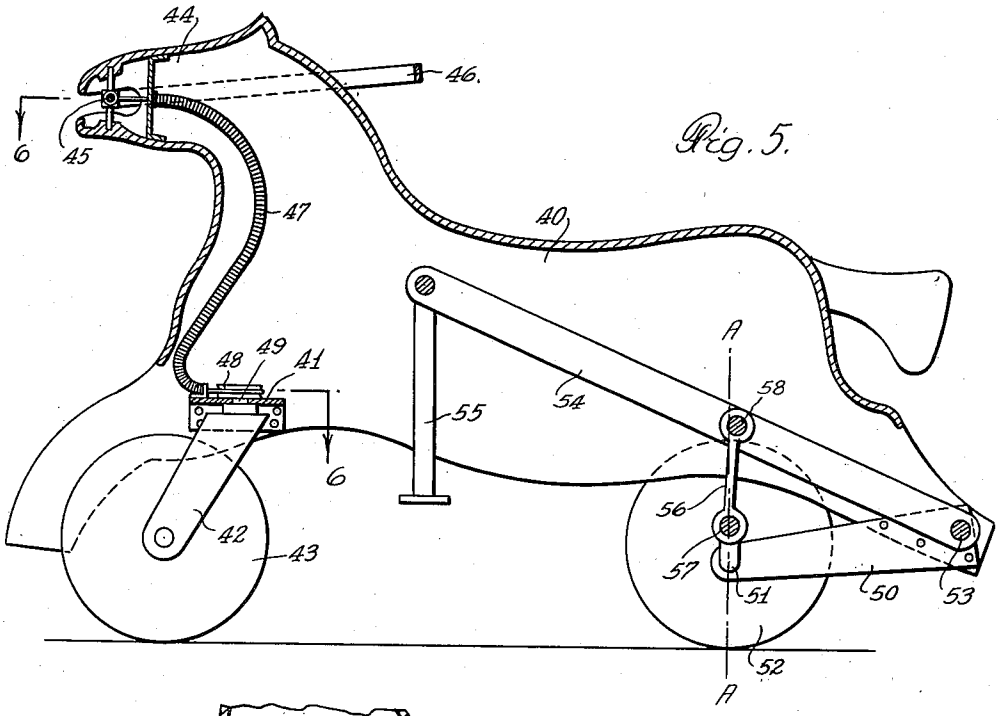


Fig. 5.

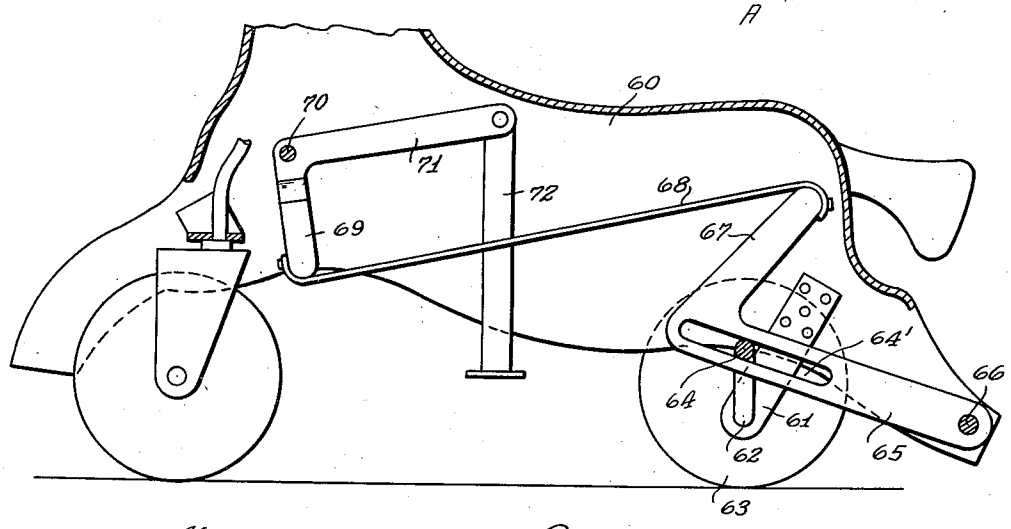


Fig. 7.

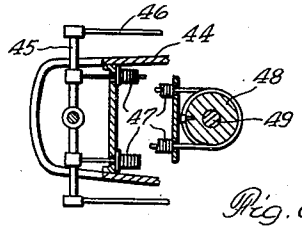


Fig. 6.

INVENTOR.
Alexander J. Middler
BY
J. Windsor Davis
ATTORNEY.

Patented Mar. 25, 1941 2,236,196

UNITED STATES PATENT OFFICE

2,236,196

TOY VEHICLE

Alexander J. Middler, Detroit, Mich.

Application January 30, 1939, Serial No. 253,569

6 Claims. (Cl. 280—1.19)

This invention relates to toy vehicles embodying propelling means actuated by shifting of the weight of a rider to a seat and foot rest members alternately and has for its primary object to provide an improved propelling means of this character.

The principal object is to provide a toy vehicle having the appearance of an animal and embodying propelling means therefor which is actuated by alternately subjecting the body and a pair of stirrups to the weight of the rider. More specifically, the main object is to provide propelling means of this character embodying a crank or eccentric arrangement which always comes to rest in a position off dead center. In toys of this character, designed for use by juveniles, the effectiveness of the toy is lost in the case of a toy having actuating means which stops on dead center for the reason that in order to initiate movement thereof it is necessary to push the same, as by the foot on the floor. In the present case, with the toy at rest, movement thereof may be initiated either by placing the weight on the body or the stirrups inasmuch as the propelling means is so designed that one or other of the body or stirrup actuated means is always in a non-dead center position.

An important object of the invention is to provide a toy propelling means embodying a single crank or its equivalent and a toy body and stirrups for actuating said crank to propel the vehicle. In this respect, the stirrups are mounted on one end of a rocking beam mounted on the wheel supporting axle between its ends and pivoted to the body of the toy in such manner that rocking movement of the beam caused by forcing the stirrups downwardly elevates the toy body with respect to said axle. The body of the toy is connected by a pitman or its equivalent to a crank on the axle in such manner that downward movement of the body rotates the crank through a half revolution, and upward movement of the body as caused by the rocking beam moves the crank to complete the revolution.

With actuating means of the character above mentioned momentum of the vehicle carries the mechanism past dead center once movement of the toy has been initiated. Normally, however, the weight of the body will move the crank to a dead center position so that a rider mounting the toy cannot initiate movement by subjecting either the body or the stirrups to weight. Accordingly, it is another object of the invention to provide a propelling means of this character which normally holds the crank off a dead center position so that either the body or the stirrups will be in a position to initiate movement.

Another object is to provide a toy vehicle embodying a body connected to wheels at eccentric points in such manner that the weight of the body, or a weight imposed thereon, causes rotation toward a lower dead center point, and a crank connected to said wheels and having stirrup actuating means therefor constructed and arranged in such manner that a weight imposed thereon rotates said wheels toward the upper dead centers of said eccentric points.

Another object is to provide propelling means of the character mentioned immediately above in which the dead centers of the crank and its actuating means are offset with respect to the dead centers of the eccentric points. With such an arrangement, the weight of the body normally positions the crank off dead center and movement of the vehicle may be initiated by placing the weight of the rider on the stirrups.

Another object is to provide crank actuating means in the form of a bell crank having one of its ends connected to the crank actuating means and a pair of stirrups mounted on its other end, said bell crank being disposed at one end of the vehicle and being connected by flexible means to the crank actuating means which is located at the other end of the vehicle.

Other objects and advantages will become more fully apparent as reference is had to the accompanying drawings wherein my invention is illustrated and in which:

Fig. 1 is a vertical section,

Fig. 2 is a fragmental section similar to Fig. 1 but with the propelling means in a different position,

Fig. 3 is a section taken on the line 3—3 of Fig. 2,

Fig. 4 is a fragmental vertical section illustrating a modified propelling means,

Fig. 5 is a vertical section illustrating a simplified actuating means,

Fig. 6 is a section taken on the line 6—6 of Fig. 5, and

Fig. 7 is a vertical section illustrating a modified arrangement of the stirrup means.

Referring to Figs. 1 to 3, 1 designates a toy vehicle body shaped to resemble an animal such as a horse. Attached to the forward end of the body by a bracket 2 is a fork 3 in which a wheel 4 is rotatably mounted. Extending upwardly from the fork 3 is a rod 5 having a crank formation 6 at its upper end pivoted at 7 in a fixed bracket 8 mounted in the head portion 9 of the horse-like

body 1. Pivoted at 10 in the bracket 8 is a forked lever 11 whose forked end contacts the rod 5 in such manner that movement of the lever 11 about its pivot 10 causes pivotal movement of the rod 5 and the steer wheel 4. The lever 11 is manually pivoted by means of reins 12 which are attached to opposite ends of a laterally extending rod 13 carried by the lever.

At the rear of the body 1 is provided an axle 14 having wheels 15 on the ends thereof, at least one of which is connected to the axle for rotation therewith. A pair of beams 16 have extended portions 17 journalled on the axle 14, their rear ends are pivotally connected at 18 to the body 1, and stirrups 19 are suspended from the forward ends.

The axle 14 has a crank 20 and a pitman 21 extends therefrom to the free end of a lever 22 which is pivoted on a cross member 23 extending between the two beams 16. A pair of links 24 have their upper ends pivotally connected at 25 to the body 1 and their lower ends pivotally connected at 26 to the pitman 21 and the lever 22. A comparatively strong spring 28 is mounted on the pitman 21 and engages pins 29 on the lever 22 to bias movement of the pitman and lever to a position where a straight line extending between the centers of the crank 20 and the pivot 26 will intersect a straight line extending between the centers of the pivots 23 and 26 at right angles.

The pitman 21, lever 29 and links 24 are so proportioned with respect to the crank 20 that the crank is off dead center when the pitman 21 and lever 22 are at right angles. As shown in Fig. 1, the weight of the body 1 tends to rotate the crank 20, but this tendency is opposed by the spring 28. When a weight is imposed on the body the crank is rotated, thus initiating movement of the vehicle, and the momentum of the vehicle plus the pressure of the spring 28 moves the crank 20 past its lower dead center. The body 1 moves downwardly with the crank 20, and causes the beams 16 to rock about the axle 14 to elevate their forward ends and the stirrups carried thereby. Then, as the weight of the rider is shifted from the body 1 to the stirrups 19 the beams 16 are reversely rocked to again elevate the body. Elevation of the body 1 pulls the crank 20 upwardly through the second half of its revolution.

In Fig. 4 there is shown an arrangement wherein the beams 30, one of which is shown, are pivoted at 31 to the body 32 and fulcrumed at 33 on an axle 34 having wheels 35 thereon. A crank 36 on the axle 34 has a pitman 37 connected thereto whose upper end carries a pin 38 which operates in a slot 39 in a bracket 40 attached to the body 32. It is desirable, of course, that two brackets similar to that shown at 40 should be provided, with one disposed at each side of the body 32.

The operation is similar to that described in conjunction with Figs. 1 to 3. When a weight is imposed on the body 32 it is caused to lower from the elevated position shown in dotted lines to that shown in full lines, thus rotating the crank 36 and rocking the beam 30 to elevate the forward end thereof. When a weight is imposed on the forward end of the beam 30 the reverse function takes place. As the body shifts its position, the angularity of the slot 39 changes to correspond, and the pin 38 rides to the higher end thereof when the body is in the lowermost position shown in Fig. 4. With the device in this position, a weight imposed on the forward end of the beam 30 rocks the same to elevate the body 32, and as the body 32 starts to elevate the pin 38 rides to the other end of the slot 39, due to the inclination thereof, which is an off center position with respect to the crank 36.

In Figs. 5 and 6 the body 40 is likewise shaped to resemble a horse. Supported by a bracket 41 in the forward end of the body 40, for movement about a substantially vertical axis, is a fork 42 having a wheel 43 rotatably mounted therein. Pivoted in the head portion 44 is a cross arm 45 having reins 46 connected to the ends thereof. A pair of Bowden wires 47 are connected to the cross arm 45 on opposite sides of its pivot, and to a spool 48 on the fork support 49. As the cross arm is pivoted by manual pressure on the reins 46 the fork 42 pivots correspondingly, thus enabling steering of the vehicle.

Fixed to the rear of the body 40 are two brackets 50 (one of which is shown) which are journalled at their forward ends on an axle 51 having a pair of wheels 52 (one of which is shown) mounted eccentrically thereon. Pivoted at one end to the body 40, as indicated at 53, is a lever 54 having stirrups 55 on its free end. A pitman 56 has one end connected to a crank 57 on the axle 51 and its other end connected at 58 to the lever 54.

When the vehicle is in its normal unloaded position the weight of the body 40 rotates the wheels 52 to a position where the eccentric points of attachment of the wheels and axle are in the same vertical plane as the center of the wheels and the center of the crank 57, which plane is represented by the line A—A. The point of attachment 58 between the pitman 56 and the lever 54 is offset slightly from this vertical plane, to the right hand side thereof as shown, and as the lever 54 pivots downwardly it passes through said plane and to the left hand side thereof. The dead centers of the eccentric wheel mounting and the crank are thus offset with respect to each other.

In Fig. 7 the body 60 is connected by a bracket 61 to an axle 62 having a wheel 63 eccentrically mounted thereon, and it will readily be understood that this structure is duplicated at each side of the body. On the axle 62 is a crank 64 which extends through a slot 64' in a lever 65 which is pivoted at 66 to the body 60. The lever 65 has an upstanding portion 67 connected by a flexible connecting member 68 to the end 69 of a bell crank lever pivotally mounted at 70 in the body 60. The other end 71 of the bell crank lever has stirrups 72 suspended from the extremity thereof.

The weight of the body 60 ordinarily rotates the wheel 63 to the position shown in Fig. 7, where the eccentric connection between the axle 62 and the wheel 63 is in its lower dead center position. The slot 64' in the lever 65 is at an angle to the horizontal and as the bell crank is rocked by a weight on the stirrup the lever 65 is pivoted downwardly and it imparts rotation to the crank. Rotation of the wheel 63 elevates the body 60, due to the eccentricity of the wheel, and the angularity of the slot 64' is such that the body is completely elevated and the crank 64 moved to position the wheels past the upper dead center of their eccentric mounting.

Although specific embodiments of the invention have been illustrated and described, it will be understood that various changes may be made within the scope of the appended claims without

departing from the spirit of the invention, and such changes are contemplated.

What is claimed is:

1. In combination, an axle having wheels eccentrically mounted thereon, a body mounted on said axle, a crank on said axle, a lever pivoted on said body, and means operatively connecting said lever with said crank, said last named means being disposed such that their dead centers are offset with respect to the dead centers of the eccentric wheels.

2. In combination, an axle having wheels eccentrically mounted thereon, a body mounted on said axle, a crank on said axle, a lever pivoted on said body, and means operatively connecting said lever with said crank, said last named means comprising a walled slot in said lever receiving said crank.

3. In combination, an axle having wheels eccentrically mounted thereon, a body mounted on said axle, a crank on said axle, a lever pivoted on said body, a pitman between said lever and said crank, the center of the wheel, the eccentric mounting therefor and the crank all residing in a single vertical plane when said eccentric mounting is in upper or lower dead center positions, and the center of the connection between said pitman and lever being on one side of said plane at upper dead center and at the other side at lower dead center.

4. In combination, an axle having wheels eccentrically mounted thereon, a body mounted on said axle, a crank on said axle, a lever pivoted on said body, means connecting said lever to said crank to rotate said crank by pivotal movement of said lever, a bell crank pivoted in said body, a flexible connection between one end of said bell crank and said lever, and weight receiving means on the other end of said bell crank.

5. In combination, an axle having wheels eccentrically mounted thereon, a body mounted on said axle, a crank on said axle, a lever pivoted on said body, said lever having an inclined slot therein receiving said crank, a bell crank pivoted in said body remote from said axle, means connecting one end of said lever to said bell crank, and means on the other end of said lever for receiving actuating weight.

6. In combination, dual means comprising a body and a foot rest pivoted on said body and each adapted to receive the weight of a person alternately, an axle, wheels mounted eccentrically on said axle, a single crank on said axle in substantially opposed relation to the eccentricity of said wheels, connecting means between one of said dual means and the axle and coacting with the eccentricity of said wheels to rotate said axle through one half a revolution by a weight imposed on said one dual means, connecting means between the other of said dual means and said crank and coacting with said crank to rotate said axle through the remaining half of the revolution by a weight imposed on said other of said dual means.

ALEXANDER J. MIDDLER.