Oct. 12, 1937. R. LOHR 2,095,646

TOY KICKING ANIMAL WITH CART

Filed Nov. 28, 1936

Fig. 1.

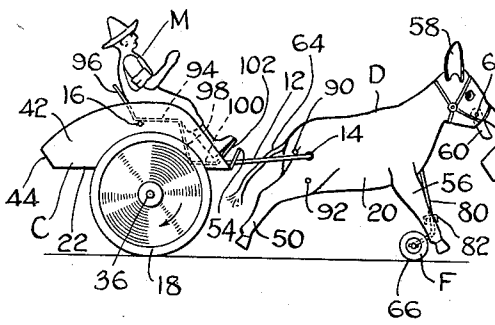



Fig. 2.

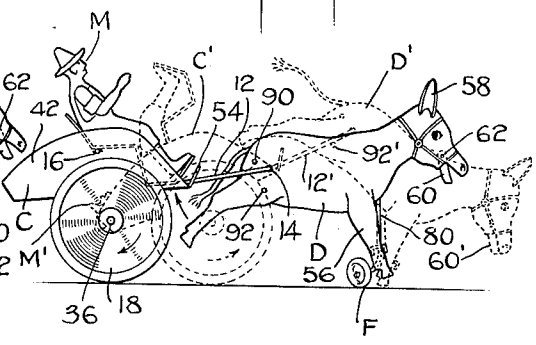



Fig. 3.

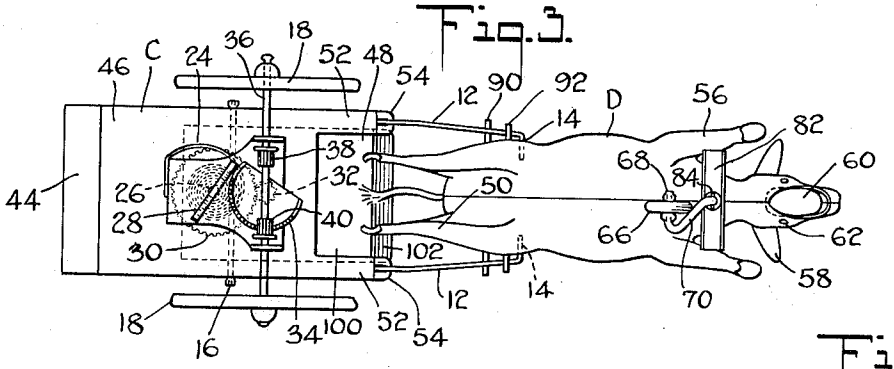



Fig. 4.

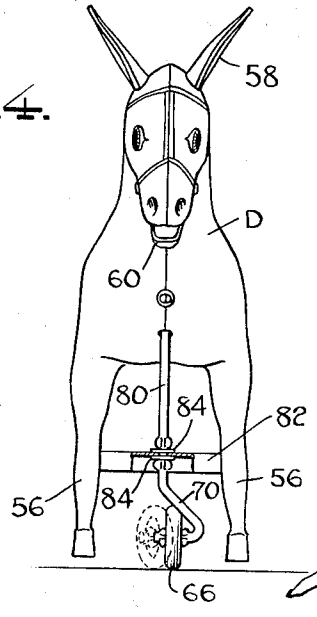
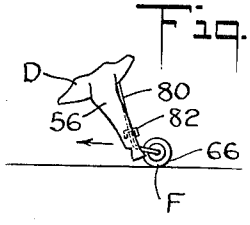



Fig. 5.




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Patented Oct. 12, 1937 2,095,646

# UNITED STATES PATENT OFFICE

2,095,646

## TOY KICKING ANIMAL WITH CART

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Application November 28, 1936, Serial No. 113,149

20 Claims. (Cl. 46—101)

This invention relates to toys, and more particularly to vehicle toys, especially a toy simulating a kicking animal with a cart.

The primary object of my invention is to generally improve vehicle toys, particularly toys simulating a kicking animal and cart. More broadly, an object of the invention resides in the provision of a vehicle toy having end portions pivotally connected together at the middle of the toy and thereby adapted to rise upwardly at the center, the resulting movement being obtained by the use of automatically reversing driving mechanism at one end of the toy.

Still another object of my invention resides in the provision of a kicking animal and cart toy in which the cart carries a simulated driver movably mounted on the cart and so balanced as to be upset when the animal rears upwardly. In accordance with still another object and feature of my invention, the driver is actually kicked by the hind legs of the animal and is thereby upset.

A further object of my invention is to so arrange the toy that its action will be relatively erratic and unpredictable both in direction of movement and in the timing of the kicking action of the animal, thus excellently simulating the true movement of a balky, cranky, untamed animal.

To the accomplishment of the foregoing and other objects which will hereinafter appear, my invention consists in the toy elements and their relation one to the other, as hereinafter are more particularly described in the specification and sought to be defined in the claims. The specification is accompanied by a drawing in which:

Fig. 1 is a side elevation of a toy embodying features of my invention and showing the same in normal position;

Fig. 2 is a similar view showing the successive positions of the toy during its forward movement and kicking operation;

Fig. 3 is an inverted plan view of the toy;

Fig. 4 is a front elevation; and

Fig. 5 shows the position of the pilot wheel during rearward movement of the toy.

Referring to the drawing, the toy comprises a simulated donkey D, a simulated cart C preferably of the two-wheel type, and a simulated driver M seated on the cart. The cart is provided with forwardly projecting thills 12 between which the donkey D is pivoted as at 14. Because of this pivotal connection the donkey is free to rear upwardly, as is indicated by the dotted line position D' in Fig. 2, and as a result of this movement the thills 12 are carried upwardly as indicated at 12', thus dumping the cart C, as is indicated at the broken line position C'. The driver M is preferably movable on the cart, as by a pivotal mounting at 16, and the arrangement is such that when the cart is dumped to the position C' the driver M is upset still further to the broken line position M'.

To produce the desired kicking or dumping action, I provide the forelegs of the animal with friction-producing means F adapted to move along the floor but to resist forward movement. Inasmuch as the driving action of the rear wheel 18 of the cart tends to cause the wheel to run forwardly toward the friction-producing means F, and inasmuch as the pivot 14 is elevated well above the axes of the wheels, there is an immediate tendency for the toy to rise at the center, and this causes the desired rearing of the animal. Of course, during rearward movement of the toy, that is, when the driving wheel 18 rotates in opposite direction and tends to move away from the means F, the natural tendency is to draw the animal downwardly from its upwardly reared position, thus restoring the toy to the normal position shown in Fig. 1.

In effect the toy is a vehicle toy comprising end portions 20 and 22 pivotally connected together at their adjacent ends at 14. One end portion is provided with a motion-resisting means F, while the other is provided with a driving wheel 18 which runs alternately in opposite directions. When driving wheel 18 runs toward the opposite end of the toy, the toy is elevated at the middle, but when driving wheel 18 moves away from the opposite end of the toy, the toy is dropped at the middle.

Considering the arrangement in greater detail and referring now to Fig. 3, the spring motor is most conveniently mounted on cart C. In the present case the spring motor may be of known type, and comprises a main spring 24 spirally wound about a vertical winding stem 26, the lower end of which may be bent to form a winding key 28. A gear 30 is mounted on winding stem 26 and may be driven through appropriate ratchet mechanism to permit winding of the spring without rotation of the gearing. Gear 30 meshes with a pinion 32 which in turn drives a crown gear 34 nearly half of the teeth of which are cut away. The cart axle 36 is provided with pinions 38 and 40 adapted to alternately mesh with mutilated crown gear 34. It will be understood that while the crown gear rotates in one direction, the axle 36 is alternately rotated in opposite directions, depending upon which of the pinions 38 and 40 is engaged by the crown gear. It will also be understood that the number of

teeth left on the crown gear is such that one pinion comes into engagement just as the other pinion is freed from engagement. The axle is thus driven forwardly for several revolutions and then rearwardly for several revolutions. For reasons subsequently explained, only one of the wheels 18 is secured to the axle 36, the other being freely rotatable, but both may be driven, if desired.

The cart C is formed of a single piece of sheet metal having side walls 42 and a rear end wall 44 bent upwardly from its bottom wall 46. The bottom wall 46 is preferably cut away as is indicated at 48 to clear the path of movement of the hind legs 50 of the animal. The remaining parts 52 of the bottom wall are bent upwardly, as is indicated at 54, forming ears or supports through which the thills 12 pass. The thills are, of course, rigidly secured to the cart at the side edges thereof.

The animal D in this case simulates a donkey and is made up of two outwardly convexed pieces of sheet metal secured together in edge to edge relation by appropriate tongue and slot connections. The forelegs 56 and the hind legs 50 are rigidly secured to the body, and a very realistic operation is obtained without complicating the toy in an effort to cause movement of the legs with respect to the body. The ears 58 may be made of sheet rubber, thus affording a degree of movement, and the lower jaw 60 may be pivoted to the head at 62, the jaw opening when the toy is in the position of Fig. 1, but closing when the toy is in the broken line position of Fig. 2. The tail 64 may be of flexible cord or the like.

The friction-producing means F may be a small drag or skid, but I prefer to use an eccentrically mounted pilot wheel 66. This wheel is freely rotatable on the lower end of a stiff rod, the said rod being bent sidewardly at 70 and then upwardly to form a spindle 80 which is freely oscillatable with respect to the donkey. The upright rod 80 is carried in an upper bearing formed by simply perforating the animal at the chest, and is carried by a lower bearing formed by a cross-bar or channel 82 secured between the forelegs 56, as is best shown in Fig. 4. The rod 80 may be provided with appropriate means 84 to limit the same against axial movement while permitting free rotation thereof.

The action of pilot wheel 66 is not altogether easy to explain. By actual experiment I find that if a simple fixedly mounted (but freely rotatable) wheel is employed, the toy will not function properly, for it merely runs back and forth without kicking. However, by using the wheel with an eccentric or caster-like mounting, the desired operation is effectually obtained. During forward movement the tendency of wheel 66 is to assume the position shown in Fig. 1, whereas during rearward movement the tendency of wheel 66 is to assume the position shown in Fig. 5. My theory is that because of the caster wheel mounting, the wheel must change between the positions of Fig. 1 and Fig. 5 each time the toy reverses its direction of operation. During the transition of the pilot wheel from one position to the other, it at least transitorily assumes an angular position transverse to the direction of movement of the toy. Upon forward movement of the toy, this transverse position of the pilot wheel creates a resistance to forward movement, which causes the toy to rise or kick. Upon rearward movement of the toy the angular position of the pilot wheel causes a change in the direction of movement of the toy, and also causes the toy to be restored to the lowered or normal position. In other words, at that instant when the drive wheel changes direction and the caster wheel is also changing direction, the caster wheel offers enough resistance to cause the donkey to kick up and later to return to the ground.

Of course, the arcuate movement of the toy is aided by making only one of the two wheels a driving wheel, and the said driving wheel may, if desired, be slightly roughened, or made of wood, or otherwise treated to prevent excessive slippage.

The particular toy here illustrated is modified somewhat from a true caster mounting, although it should be understood that the toy will function satisfactorily even with a true caster mounting. Specifically, the pilot wheel is offset sidewardly with respect to rod 80, that is, its mounting is eccentric when viewed as in Fig. 4, as well as when viewed as in Figs. 1 and 5. Because of this, there is a tendency for the wheel 66 to turn sidewardly, i. e., to an angular position during forward movement, even if the caster wheel is started in the position shown in Fig. 1. This will be evident by comparison of the solid line showings in Figs. 1 and 2, Fig. 1 showing the position of the wheel at the beginning of forward movement and Fig. 2 showing the position of the wheel after a small amount of forward movement. The action is rather difficult to describe in a satisfactory manner, but in practice the pilot wheel turns sidewardly and frictional engagement with the floor tends to complete the sideward movement so that the wheel soon assumes a position entirely transverse to the toy and thus acts as friction-producing means which resists movement at the forelegs sufficiently to cause rearing of the toy. During reverse movement of the toy, however, the pilot wheel is not turned sidewardly and instead tracks freely. The only effect of the sideward eccentricity during rearward movement of the toy is some tendency for the pilot wheel to assume a slightly angular position which causes the toy to move on a curve rather than a straight path. This effect is desired and is enhanced by reason of the fact that only one of the two cart wheels acts as a driving wheel, the other wheel being loose on the axle.

The means F also differs from a true caster in that the rod 80 is not truly vertical, but instead slopes rearwardly somewhat, as is clearly shown in Figs. 1 and 5. For this reason the wheel 66 is higher relative to the donkey when moved to the position of Fig. 5 than when moved to the position of Fig. 1. For this reason the arrangement is inherently stable when in the position of Fig. 5 and is inherently unstable when in the position of Fig. 1, this being so because of the attraction of gravity on the donkey. If the slant of rod 80 is made too large the wheel 66 tends to remain always in the position of Fig. 5, and this is undesirable. Instead, rod 80 should be disposed at a slope only sufficient for the tendency towards stability in the position of Fig. 5 to overcome the eccentricity of the mounting (this eccentricity is best shown in Fig. 4). The wheel 66 then tends to turn away from the position in Fig. 1 on forward movement both because of the slope of rod 80 and because of the eccentricity of the wheel mounting. It does not swing all the way to the position of Fig. 5 during forward movement, being opposed by the main movement of the toy, but it reaches a transverse position which causes bucking of the toy. When the motor reverses the direction of movement of

the toy, the wheel 66 promptly and readily moves to the position shown in Fig. 5, and then acts as a relatively frictionless pilot wheel during the reverse movement of the toy.

It should be understood that these changes from true caster construction are not essential to make the toy operative.

It may also be pointed out that if the wheel F strikes any irregularity on the floor or running surface while running forwardly, the result is an immediate rearing or kicking by the animal. Because of this fact the toy sometimes kicks immediately upon beginning forward movement, and at other times does not kick until after it has run forwardly for some distance. If the obstruction or roughness of the floor is slight the toy will immediately kick but will continue running for a short distance in reared position. If the obstruction is larger, as for example the edge of a rug, the toy will kick and stop short as though balking, and after remaining in that position for an instant, will return to normal position and run backward. The toy is not stopped altogether from continued operation because the driving wheel slips on its running surface the necessary amount until the reverse pinion comes into action, whereupon the toy moves away from the obstruction. Because the toy curves in one direction or another, depending upon the eccentric movement of the freely oscillatable pilot wheel, and because the pilot wheel functions markedly differently during the forward and rearward movement of the toy, the path traversed by the toy is altogether erratic and unpredictable, and the action of the toy is, of course, highly amusing to watch.

In order to limit the relative movement of the donkey and the cart, the donkey is preferably provided with motion-limiting stop pins 90 and 92. These pins may for simplicity extend entirely through the toy and are so located that the pins 90 limit the downward movement of the donkey to the position shown in Fig. 1, while the pins 92 limit the upward movement of the donkey to the position shown in broken lines in Fig. 2.

The driver M is an ordinary sheet metal figure toy formed of outwardly convexed pieces of sheet metal secured together in edge to edge relation by appropriate bent tongue connections. This figure is fixedly mounted on a combined seat and floor board formed by appropriately bending a single piece of sheet metal. The sheet metal is bent or stepped to form a seat 94, a back 96, a wall 98 a floor board 100 and a foot board 102. The feet of the driver may simulatedly rest directly on the foot board 102. The combined seat member is oscillatably mounted on the car by means of a rod 16 which extends through the cart from side wall to side wall. The floor board 100 and/or the foot board 102 are disposed over the cut-away part 48 of the bottom of the cart and lie directly in the path of movement of the hind legs 50 of the donkey. Consequently when the donkey rears or kicks, the hind legs strike the foot board and upset the driver with the seat rearwardly into the cart, as is indicated by the broken line position shown in Fig. 2. The driver remains in this position until the cart is restored to the level position shown in Fig. 1, at which time the driver is moved to the normal erect position by gravitational influence. In other words, the axis of oscillation 16 is so selected that the driver naturally assumes the position shown in Fig. 1 when the cart is in the position shown in Fig. 1, but naturally assumes the position shown in broken lines (Fig. 2) when the cart is in the broken line position. In fact, the upsetting of the driver into the cart may, if desired, be obtained without a direct kicking action by the donkey, but I prefer to use the direct kicking action, first because of the greater realism and amusement caused thereby, and second, because it makes it unnecessary to use a critically exact balance for the driver, and a large degree of manufacturing tolerance may be used.

It is believed that the construction and operation, as well as the many advantages of my improved toy, will be apparent from the foregoing detailed description thereof. The kicking action of the toy may be made sensitive and requires but slight resistance at the forelegs of the toy. The resulting operation is surprisingly erratic and unpredictable, and the continued movements of the toy are altogether variable in direction and timing. The toy is thereby made both realistic and extremely amusing.

It will be apparent that while I have shown and described my invention in a preferred form, many changes and modifications may be made in the structure disclosed without departing from the spirit of the invention defined in the following claims.

I claim:

1. A toy comprising a simulated animal and a simulated cart, the forward end of the cart being pivotally connected to the rear end of the animal, means at the forelegs of the animal adapted to move along the floor, a motor on the cart, means including automatically reversing mechanism gearing said motor to a wheel of the cart in order to drive the cart forwardly and rearwardly in alternation, the toy being so arranged that on forward movement of the cart the resistance to movement at the forelegs of the animal is such that the animal rears upwardly and simulatedly dumps the cart.

2. A toy comprising a simulated animal and a simulated two-wheel cart, the cart being provided with forwardly projecting thills between which the rear end of the animal is pivotally mounted, means at the forelegs of the animal adapted to move along the floor, a motor on the cart, means including automatically reversing mechanism gearing said motor to a wheel of the cart in order to drive the cart forwardly and rearwardly in alternation, the arrangement and balance of the toy being such that on forward movement of the cart the resistance to movement at the forelegs of the animal causes the animal to rear upwardly with the thills and to simulatedly dump the cart.

3. A toy comprising a simulated animal and a simulated cart, the cart being provided with forwardly projecting thills between which the animal is pivotally mounted, means at the forelegs of the animal adapted to move along the floor, said means being somewhat resistant to forward movement but not to rearward movement, the toy being so arranged that on forward movement of the cart the resistance to movement at the forelegs of the animal is such that the animal rears upwardly and simulatedly dumps the cart.

4. A toy comprising a simulated animal and a simulated cart, the cart being provided with forwardly projecting thills between which the animal is pivotally mounted, means at the forelegs of the animal adapted to move along the floor, said means being somewhat resistant to

forward movement but not to rearward movement, a motor on the cart, means including automatically reversing mechanism gearing said motor to a wheel of the cart in order to drive the cart forwardly and rearwardly in alternation, the toy being so arranged that on forward movement of the cart the resistance to movement at the forelegs of the animal is such that the animal rears upwardly and simulatedly dumps the cart.

5. A toy comprising a simulated animal and a simulated cart, the forward end of the cart being pivotally connected to the rear end of the animal, a pilot wheel at the forelegs of the animal and means eccentrically pivoting the same, a motor on the cart, means including automatic reversing mechanism gearing said motor to a wheel of the cart in order to drive the cart forwardly and rearwardly in alternation, the arrangement being such that on forward movement of the cart the pilot wheel tends to assume a transverse position creating a resistance to movement such that the animal rears upwardly with the forward end of the cart.

6. A toy comprising a simulated animal and a simulated two-wheel cart, the cart being provided with forwardly projecting thills between which the rear part of the animal is pivotally mounted, a pilot wheel at the forelegs of the animal and means eccentrically pivoting the same for free steering oscillation, a motor on the cart, means including automatic reversing mechanism gearing said motor to a wheel of the cart in order to drive the cart forwardly and rearwardly in alternation, the arrangement being such that on forward movement of the cart the pilot wheel tends to assume a transverse position creating a resistance to movement such that the animal rears upwardly and simulatedly dumps the cart about its axle.

7. A toy comprising a simulated animal and a simulated cart, the cart being provided with forwardly projecting thills between which the rear part of the animal is pivotally mounted, a simulated driver pivoted on the cart, the driver being so balanced as to normally assume an erect position when the cart is in normal position, means at the forelegs of the animal adapted to move along the floor, a motor on the cart, means including automatic reversing mechanism gearing said motor to a wheel of the cart in order to drive the cart forwardly and rearwardly in alternation, the arrangement and balance of the toy being such that on forward movement of the cart the resistance to movement at the forelegs causes the animal to rear upwardly and to simulatedly dump the cart about its axle, and upsets the driver on the cart, and when the cart moves rearwardly the cart, animal, and driver are restored to normal position.

8. A toy comprising a simulated animal and a simulated cart, the cart being provided with forwardly projecting thills between which the animal is pivotally mounted, a simulated driver pivoted on the cart, the driver being so balanced as to normally assume an erect position when the cart is in normal position, means at the forelegs of the animal adapted to move along the floor, said means being somewhat resistant to forward movement but not to rearward movement, the toy being so arranged that on forward movement of the cart the resistance to movement is such that the animal rears upwardly and simulatedly dumps the cart, the hind legs of the animal striking and upsetting the driver on the cart, and when the cart moves rearwardly, the cart, animal, and driver are restored to normal position.

9. A toy comprising a simulated animal and a simulated cart, the cart being provided with forwardly projecting thills between which the animal is pivotally mounted, a simulated seat and foot board oscillatably mounted between the side walls of the cart, a simulated driver on the seat, the seat and driver being so balanced as to normally assume an erect position when the cart is in normal position, means at the forelegs of the animal adapted to move along the floor, a motor on the cart, means including automatic reversing mechanism gearing said motor to a wheel of the cart in order to drive the cart forwardly and rearwardly in alternation, the arrangement and balance of the toy being such that on forward movement of the cart the resistance to movement at the forelegs causes the animal to rear upwardly and to simulatedly dump the cart about its axle, the hind legs of the animal striking the foot board and upsetting the driver and seat on the cart, and when the cart moves rearwardly the cart, animal, and driver are restored to normal position.

10. A toy comprising a simulated animal and a simulated two-wheel cart, the cart being provided with forwardly projecting thills between which the rear part of the animal is pivotally mounted, a simulated driver pivoted on the cart, the driver being so balanced as to normally assume an erect position when the cart is in normal position, a pilot wheel at the forelegs of the animal and means eccentrically pivoting the same for free steering oscillation, a motor on the cart, means including automatic reversing mechanism gearing said motor to a wheel of the cart in order to drive the cart forwardly and rearwardly in alternation, the arrangement and balance of the toy being such that on forward movement of the cart the pilot wheel is relatively unstable and tends to assume a transverse position creating a resistance to movement such that the animal rears upwardly and simulatedly dumps the cart about its axle, and upsets the driver on the cart, and when the cart moves rearwardly the cart, animal and driver are restored to normal position.

11. A toy comprising a simulated animal and a simulated two-wheel cart, the cart being provided with forwardly projecting thills between which the rear part of the animal is pivotally mounted, a simulated seat and foot board oscillatably mounted between the side walls of the cart, a simulated driver on the seat, the seat and driver being so balanced as to normally assume an erect position when the cart is in normal position, a pilot wheel at the forelegs of the animal and means eccentrically pivoting the same for free steering oscillation, a motor on the cart, means including automatic reversing mechanism gearing said motor to a wheel of the cart in order to drive the cart forwardly and rearwardly in alternation, the arrangement and balance of the toy being such that on forward movement of the cart the pilot wheel is relatively unstable and tends to assume a transverse position creating a resistance to movement such that the animal rears upwardly and simulatedly dumps the cart about its axle, the hind legs of the animal striking the foot board and dumping the driver and seat rearwardly on the cart, and when the cart moves rearwardly the cart, animal and driver are restored to normal position.

12. A toy comprising a simulated cart, a simu-

lated animal, thills extending forwardly from the cart between which the animal is pivotally mounted, a simulated driver pivoted on the cart, and motor means for driving the toy and for causing simulated kicking of the animal, the path of movement of the hind legs of the animal being such that when the animal rears the hind legs strike the driver and cause the driver to fall over backwardly on the cart.

13. A toy comprising a simulated cart, a simulated animal, thills extending forwardly from the cart between which the animal is pivotally mounted, a seat and foot board oscillatably mounted on the cart, a simulated driver on the seat, and motor means for driving the toy and for causing simulated kicking of the animal, the path of movement of the hind legs of the animal being such that when the animal rears the hind legs strike the foot board and cause the seat and driver to fall over backwardly on the cart.

14. A toy comprising a cart including wheels and an axle about which the cart is oscillatable, an animal including a wheel near its forward end about which the animal is oscillated, a pivotal connection between the forward end of the cart and the rear end of the animal, a motor for driving said toy, and automatic reversing mechanism between the motor and a wheel of the toy for driving the toy repeatedly forwardly and backwardly, the balance of the toy being relatively unstable whereby during movement in one direction when the power-driven wheel at one end of the toy tends to move toward the opposite end of the toy the middle of the toy rises upwardly, simulating rearing of the animal and dumping of the cart, whereas when the power-driven wheel at one end of the toy tends to move away from the opposite end of the toy the middle of the toy descends, whereby the toy is restored to normal position.

15. A toy comprising a cart including wheels and an axle about which the cart is oscillatable, an animal including an unstably pivoted wheel near its forward end about which the animal is oscillatable, a pivotal connection between the forward end of the cart and the rear end of the animal, a motor for driving said toy, and automatic reversing mechanism between the motor and a wheel of the toy for driving the toy repeatedly forwardly and backwardly, the balance of the toy being relatively unstable whereby during movement in one direction when the power-driven wheel at one end of the toy tends to move toward the opposite end of the toy the middle of the toy rises upwardly, simulating rearing of the animal and dumping of the cart, whereas when the power-driven wheel at one end of the toy tends to move away from the opposite end of the toy the middle of the toy descends whereby the toy is restored to normal position.

16. A vehicle toy comprising end portions oscillatably connected together at their adjacent ends and provided with motion-limiting means whereby the parts of the toy may rise upwardly or sink downwardly at the center to a limited extent, a driving wheel near one end of the toy, friction producing means near the other end of the toy, a motor, and automatic reversing mechanism between the motor and the driving wheel for repeatedly driving the toy forwardly and rearwardly, the arrangement being such that when the driving wheel moves toward the opposite end of the toy the center of the toy rises upwardly, and when the driving wheel moves away from the opposite end of the toy the center of the toy sinks downwardly.

17. A toy as defined in claim 16, in which the friction-producing means includes a freely rotatable wheel oscillatable about an upright axis and eccentrically mounted with respect to that axis.

18. A toy as defined in claim 16, in which the friction-producing means is operative to resist movement of the toy when the driving wheel moves toward said means, but is inoperative when the driving wheel moves away from said means.

19. A toy as defined in claim 16, in which the friction-producing means includes a wheel freely rotatable about a horizontal axis disposed at the end of an arm extending transversely of an upright axis about which the arm and wheel are freely oscillatable, the said upright axis sloping rearwardly from its lower towards its upper end.

20. A toy comprising a simulated animal and a simulated two-wheel cart, the cart being provided with forwardly projecting thills between which the animal is pivotally mounted, a pilot wheel at the forelegs of the animal, said wheel being freely rotatable about a horizontal axis disposed at the end of an arm extending transversely of an upright axis, said upright axis being journalled between the forelegs of the animal and sloping rearwardly upwardly, a motor on the cart, means including automatic reversing mechanism gearing said motor to a wheel of the cart in order to drive the cart forwardly and rearwardly in alternation, the arrangement being such that on forward movement of the cart the pilot wheel tends to assume a transverse position creating a resistance to movement such that the animal rears upwardly and simulatedly dumps the cart about its axle.

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