July 1, 1947. A. J. MIDDLER 2,423,248

FRONT DRIVE TOY VEHICLE

Filed April 28, 1945 2 Sheets-Sheet 1

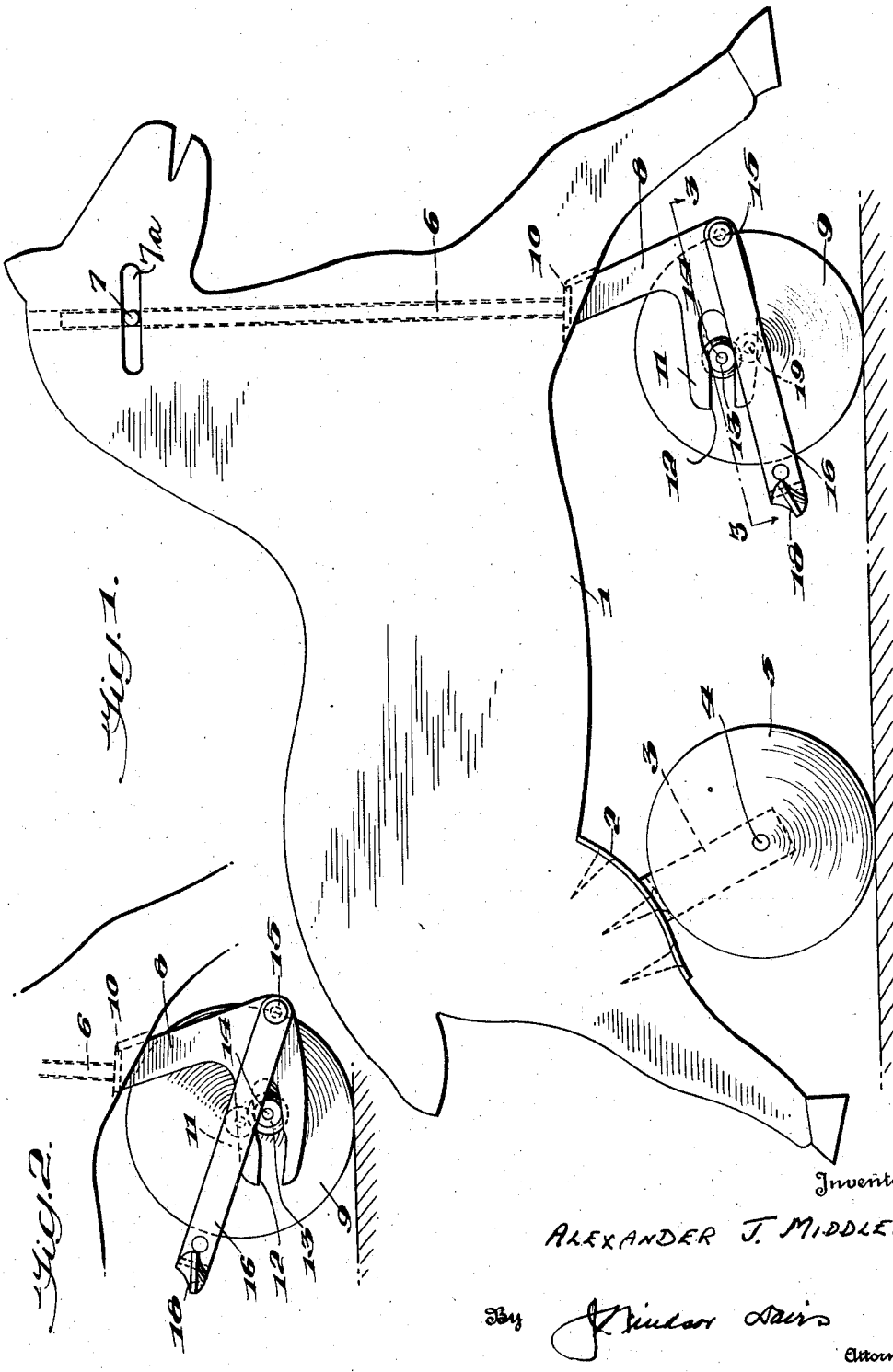


Fig. 1.

Fig. 2.

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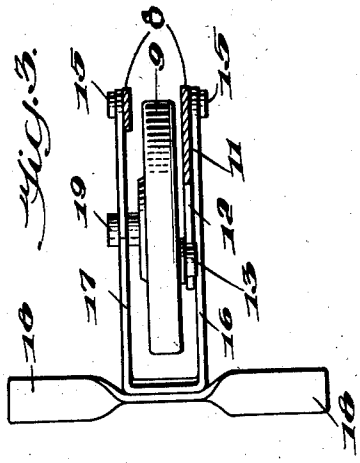


Fig. 3.

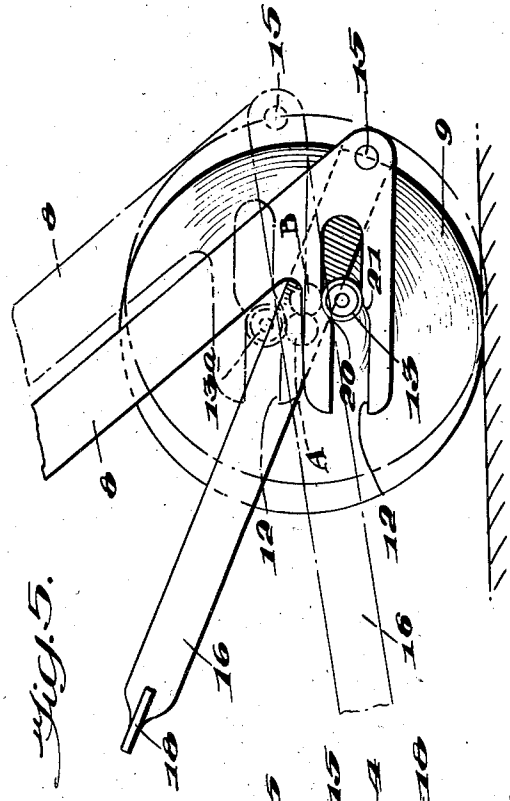


Fig. 5.

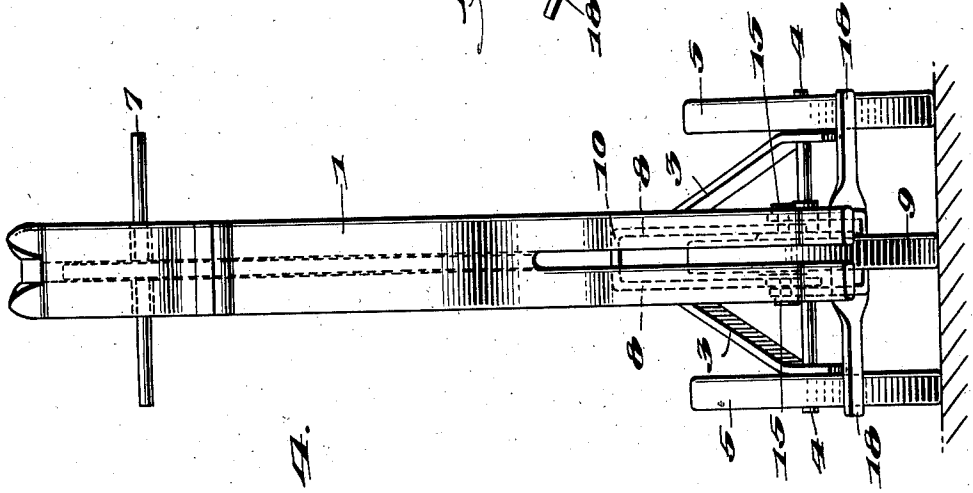


Fig. 4.

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FRONT DRIVE TOY VEHICLE

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6 Claims. (Cl. 280—1.19)

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This invention relates to toy vehicles of the type which can be ridden by a child and has for its object to provide a toy having a body resembling an animal, such as a horse, which is mounted on wheels, together with means by which the child may ride and propel the toy with motions simulating the riding of a horse.

It is contemplated that the body of the horse shall be supported by two rear wheels and one steerable front wheel. Another object is to provide a propelling mechanism operative directly on the front wheel by which the front wheel may be rotated through a portion of a revolution when the rider imposes his weight on the back of the horse and through the remainder of a revolution when the rider transfers his weight to foot pedals or stirrups. The body has an up and down motion as it is propelled forwardly.

Another object is to provide a propulsion mechanism operative on the front wheel which will have no dead center position. The horse may thus be propelled by the rider at all times without touching his feet to the ground.

Other objects are to provide a construction which is sturdy economical to manufacture, of few parts and inherently of long life if manufactured of good materials.

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

Figure 1 is a side elevation of my improved toy horse with the actuating pedals shown in lowermost position,

Figure 2 is an elevation of the front wheel assembly of Figure 1 with the pedal in upper position after passing dead center position,

Figure 3 is a horizontal section taken along the line 3—3 of Figure 1,

Figure 4 is a rear view, and

Figure 5 is an enlargened view of the front wheel assembly for explanatory purposes.

More particularly, 1 indicates the body of the toy which may be made in a variety of shapes but which is suitably made to resemble a horse. Rigidly secured to the upper part of the legs of the body 1 by the screws 2 are supporting brackets 3 in which an axle 4 is journalled. Rear wheels 5 are mounted on the axle 4 for rotation therewith.

Extending vertically through the body 1 near the front end thereof is a steering column 6. The horse's head has a horizontal slot 7a therethrough through which the steering column 6

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extends, integral steering handles 7 extending from the column outwardly of the slot.

The bottom of the steering column 6 is fixedly secured to a fork 8 which straddles the front wheel 9. This yoke is inclined forwardly, as illustrated, and has a flat top portion 10 which connects its two legs and which acts as the supporting surface for the front end of the horse's body. This flat portion 10 also acts as a thrust bearing since it rotates on the body in response to steering movements of the handles 7.

Integral with one leg only of the fork 8 is a rearwardly extending portion 11 having a guide slot 12 therein to receive a roller 13 rotatably mounted by suitable bearings on a pin 14 which is secured to the wheel 9 eccentrically thereof.

Pivotally connected at 15 to the lower, forward ends of the legs of the fork 8 are two beams 16 and 17 which extend across the wheel and to the rear thereof. These beams jointly support foot rests or stirrups 18. One beam 16 is free of contact with any other part from its pivot to the stirrup, while the other beam 17 receives the axle 19 of the wheel 9 therethrough.

With respect to the slot 12 of the member 11, the walls are of cam formation intermediate their ends, as seen in Fig. 1 and as best illustrated in Figure 5. The upper cam of this slot is indicated by the numeral 20 and the lower cam by the numeral 21.

The operation is as follows, reference being had to Figures 1 and 2 and particularly to Figure 5. Figure 5 illustrates the parts in full line at the end of the period or cycle when the weight of the rider has been imposed on the saddle or body of the horse. The beams 16 and 17 with the stirrups 18 are in uppermost position, the fork 8 is in its lowermost position, the roller 13 is bearing on the upper part of the slot 12 at the bottom (right end) of the cam 20, and the wheel axle is at the position A, Figure 5 above the axis of the roller 13.

The rider now imposes his weight on the stirrups 18. The beam 17 now acts as a lever to lift the fork 8 about the axle 19 as a fulcrum, the roller 13 is pressed against the right end of the cam 21 and rolls down this cam to the left. This cam 21 thus is responsible for initiation of the rolling movement of the wheel over bottom dead center. Continued downward pressure on the stirrups further elevates the fork 8 and continues rotation of the roller 13 outwardly of the slot 12 until the stirrups are half-way on their downward travel whereupon the roller reverses its direction and continues until it reaches the

left end of the cam 21. The roller is then in the position 13a, the axle 19 is in the position B below the roller, and the yoke 8 and attached parts are in the dotted position illustrated. Thus, as the rider again seats himself the roller 13 is moved into pressure engagement with the left side of the cam 20, upon which it rolls to carry the wheel over upper dead center position. The roller 13 continues to roll in the slot to the right until the wheel 9 has moved one-fourth revolution at which time the body 1 and fork 8 have completed half their downward travel, whereupon the roller reverses its direction for the remainder of the downward travel of the body and fork. The roller 13 thus arrives at its position illustrated in full lines in Figure 5, having completed an orbit of 180° during which time the wheel has completed one revolution.

Various changes may be made without departing from the spirit of my invention and I desire to be extended protection as defined by the appended claims.

What I claim is:

1. A toy horse comprising a body, two rear wheels and a front wheel supporting said body, a fork pivotally secured to said body for horizontal rotation and straddling said front wheel, a beam in which the axle of said front wheel is secured having stirrups on one end thereof and pivotally connected to said fork at its other end, said beam acting as a lever by which said body and said fork may be elevated with respect to said front wheel when a rider imposes his weight on said stirrups, an extension on said fork having a substantially horizontal slot therein, a pin mounted eccentrically on said front wheel having a roller rotatable thereon and engaging said slot, said slot and said roller causing said wheel to roll through one half revolution during the imposition of the weight of the rider on said stirrups, said slot and said roller causing said wheel to complete a full revolution when the rider relieves his weight from said stirrups and imposes his weight on said body and on said fork.

2. A toy horse comprising a body, two rear wheels and a front wheel supporting said body for propulsion, a fork mounted under the front end of said body straddling said front wheel, parallel beams in one of which the axle of said front wheel is mounted, both of said beams being pivotally connected at one end to said fork and jointly supporting stirrups at their other ends, a roller mounted eccentrically on said wheel on the side of said wheel opposite to that in which said axle is journalled in one of said beams, an extension on one side of said fork having a substantially horizontal slot for containing said roller during rotation of said front wheel, the beam in which said axle is journalled acting as a lever to elevate said body and said fork with respect to said front wheel when the weight of a rider is imposed on said stirrups, said fork, when thus elevated, exerting a lift through the lower side of said slot to said eccentric roller thereby causing rotation of said front wheel through a portion of a revolution, said fork exerting a downward thrust on said roller through the upper side of said slot when the rider shifts his weight onto said body thereby causing rotation of said front wheel through the remainder of a revolution.

3. A toy horse comprising a body, two rear wheels and a front wheel supporting said body for propulsion, a fork mounted under the front end of said body straddling said front wheel, parallel beams in one of which the axle of said front wheel is mounted, both of said beams being pivotally connected at one end to said fork and jointly supporting stirrups at their other ends, a roller mounted eccentrically on said wheel on the side opposite to that in which said axle is journalled in one of said beams, an extension on one side of said fork having a substantially horizontal slot for containing said roller during rotation of said front wheel, the beam in which said axle is journalled acting as a lever to elevate said body and said fork with respect to said front wheel when the weight of a rider is imposed on said stirrups, said fork, when thus elevated, exerting a lift through the lower side of said slot to said eccentric roller thereby causing rotation of said front wheel through a portion of a revolution, said fork exerting a downward thrust on said roller through the upper side of said slot when the rider shifts his weight onto said body thereby causing rotation of said front wheel through the remainder of a revolution, and a steering column extending vertically upwardly through the front end of said body, said body having a longitudinal slot in the upper portion thereof through which said column extends, said column having handles extending outwardly through said slot, said fork being secured to the bottom of said column for rotation therewith.

4. A toy horse comprising a body, two rear wheels and a front wheel supporting said body for propulsion, a fork mounted under the front end of said body straddling said front wheel, parallel beams in one of which the axle of said front wheel is mounted, both of said beams being pivotally connected at one end to said fork and jointly supporting stirrups at their other ends, a roller mounted eccentrically on said wheel on the side opposite to that in which said axle is journalled in one of said beams, an extension on one side of said fork having a substantially horizontal slot for containing said roller during rotation of said front wheel, the beam in which said axle is journalled acting as a lever to elevate said body and said fork with respect to said front wheel when the weight of a rider is imposed on said stirrups, said fork, when thus elevated, exerting a lift through the lower side of said slot to said eccentric roller thereby causing rotation of said front wheel through a portion of a revolution, said fork exerting a downward thrust on said roller through the upper side of said slot when the rider shifts his weight onto said body thereby causing rotation of said front wheel through the remainder of a revolution, the lower and upper sides of said slot having short inclines intermediate the ends thereof, said inclines acting as cams to overcome the dead center upper and lower positions of said roller with respect to said slot.

5. A toy horse comprising a body, two rear wheels and a front wheel supporting said body for propulsion, a fork mounted under the front end of said body straddling said front wheel, parallel beams in one of which the axle of said front wheel is mounted, both of said beams being pivotally connected at one end to said fork and jointly supporting stirrups at their other ends, a roller mounted eccentrically on said wheel on the side opposite to that in which said axle is journalled in one of said beams, an extension on one side of said fork having a substantially horizontal slot for containing said roller during rotation of said front wheel, the beam in which said axle is journalled acting as a lever to elevate said body and said fork with respect to said front wheel when the weight of a rider is imposed on said stirrups,

said fork, when thus elevated, exerting a lift through the lower side of said slot to said eccentric roller thereby causing rotation of said front wheel through a portion of a revolution, said fork exerting a downward thrust on said roller through the upper side of said slot when the rider shifts his weight onto said body thereby causing rotation of said front wheel through the remainder of a revolution, said roller reaching a point substantially midway of the length of the lower side of said slot at the end of the travel imposed by said stirrups and when forced against the opposite wall of said slot by a shifting of the weight of the rider to the body contacting a short inclined cam portion of the upper wall of said slot whereby said roller is forced over upper dead center position.

6. A toy horse comprising a body, two rear wheels and a front wheel supporting said body for propulsion, a fork mounted under the front end of said body straddling said front wheel, parallel beams in one of which the axle of said front wheel is mounted, both of said beams being pivotally connected at one end to said fork and jointly supporting stirrups at their other ends, a roller mounted eccentrically on said wheel on the side opposite to that in which said axle is journalled in one of said beams, an extension on one side of said fork having a substantially horizontal slot for containing said roller during rotation of said front wheel, the beam in which said axle is journalled acting as a lever to elevate said body and said fork with respect to said front wheel when the weight of a rider is imposed on said stirrups, said fork, when thus elevated, exerting

a lift through the lower side of said slot to said eccentric roller thereby causing rotation of said front wheel through a portion of a revolution, said fork exerting a downward thrust on said roller through the upper side of said slot when the rider shifts his weight onto said body thereby causing rotation of said front wheel through the remainder of a revolution, said roller reaching a point substantially midway of the length of the upper side of said slot at the end of the travel imposed by the weight of the rider on said body and when forced against the opposite wall of said slot by a shifting of the weight of the rider to the stirrups contacting a short inclined cam portion of the lower wall of said slot whereby said roller is forced over lower dead center position by the initial pressure exerted on said stirrups.

ALEXANDER J. MIDDLER.

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