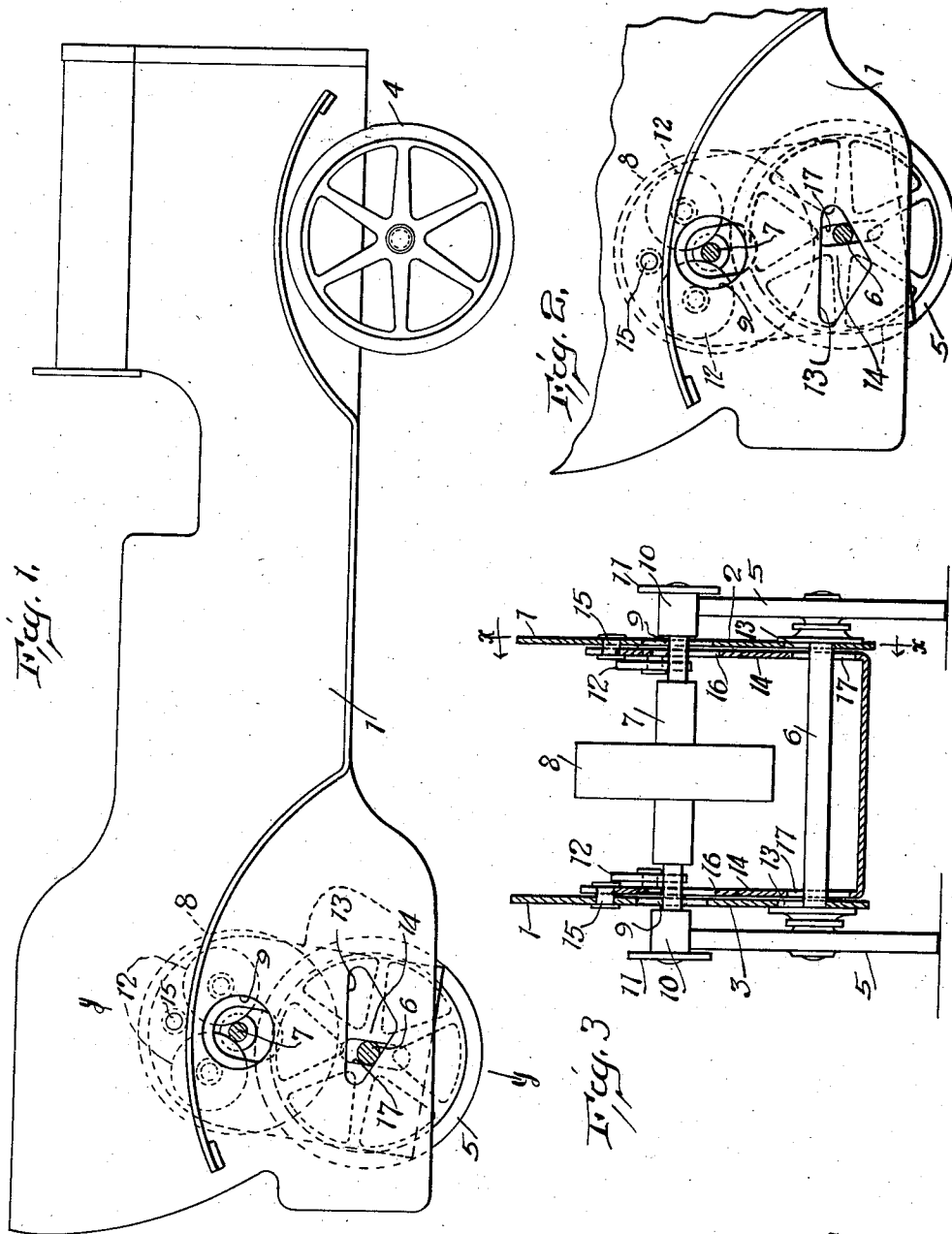


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WHEELED TOY OF THE SELF PROPELLED TYPE.
APPLICATION FILED SEPT. 28, 1911.

1,012,815.

Patented Dec. 26, 1911.



Witnesses

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WHEELED TOY OF THE SELF-PROPELLED TYPE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, DAVID P. CLARK, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Wheeled Toys of the Self-Propelled Type, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to wheeled toys of the self-propelled type and more particularly to that class of self-propelled toys in which the power is transmitted from the motor shaft to the wheels through frictional contact.

The object of the invention is to increase the efficiency of power transmission devices.

To this end it is a further object of the invention to so support the driving wheels that when the toy is moved from one position to another they will be shifted bodily into those positions in which the frictional contact with the friction members of the power shaft will be the greatest; and further to so arrange the several parts that the shifting of the driving wheels will produce a wedging action between the same and said friction members.

In the accompanying drawings, Figure 1 is a sectional view taken on the line $x x$ of Fig. 3, looking in the direction of the arrows and showing the axle for the driving wheels in the position which it occupies when the toy is being moved over the floor by hand to impart movement to the inertia wheel; Fig. 2 is a sectional view of the rear portion of the toy, taken on the same line as Fig. 1 and showing the axle in the position which it occupies when the toy is being propelled by the driving wheels; and Fig. 3 is a sectional view taken on the line $y y$ of Fig. 1.

In these drawings I have illustrated one embodiment of my invention and have shown the same as applied to a toy built to represent an automobile. It will be obvious, however, that this form is chosen merely for the purpose of illustration and that the toy may represent a wheeled vehicle of any character.

The toy comprises a body portion or main frame 1, having side members 2 and 3, the forward portion of which is supported by ground wheels 4 and the rear portion of which is supported by driving wheels 5 mounted on an axle 6 supported by the main

frame and having bodily movement relatively thereto to enable the ground wheels to be moved longitudinally relatively to the frame or the frame to be moved vertically relatively to the ground wheels. A motor shaft or a power shaft 7 is rotatably mounted in the frame above the axle 6, and, in the present instance, comprises an inertia shaft having mounted thereon the usual inertia wheel 8. The power shaft 7 extends through relatively large openings 9 formed in the side members 2 and 3 of the main frame and those portions of the shaft which extend beyond the side members rest upon the peripheries of the driving wheels 5 and constitute friction members, as indicated at 10, by means of which the power is transmitted from the shaft 7 to the driving wheels. The shaft 7 and the inertia wheel 8 are supported on the driving wheels by means of these friction members. The friction members 10 are provided at their outer ends with flanges 11 to hold the shaft against longitudinal movement sufficient to displace the friction members with relation to the wheels. In the present instance these flanges are formed by securing disks to the ends of the shaft. The openings in the side members of the main frame through which the shaft extends constitute bearings for the shaft and are provided with means to limit the downward movement of the body portion of the toy relatively to the shaft which, as stated, is supported, upon the ground wheels. In the present instance this bearing is an antifriction bearing and comprises two antifriction disks 12 spaced apart and adapted to engage the shaft on the opposite sides of its longitudinal center. While these antifriction disks or rollers may be supported in any suitable manner they are, in the present instance, mounted on a supplemental frame, as will be hereinafter described.

The axle 6, as above stated, has bodily movement longitudinally to the body portion of the toy, and, inasmuch as the shaft is supported substantially in the same vertical plane with the normal or central position of the axle it follows that any bodily movement of the axle longitudinally to the toy will carry it either to one side or the other of the shaft. In order to maintain the wheels 5 in their proper relation to the friction members of the shaft and thus en-

able the same to accommodate themselves to the varying positions of the toy as it moves up or down an incline means are provided to guide the axle in an upwardly inclined path when it is moved either to the front or the rear of the shaft. In the present instance the side members 2 and 3 of the body portion of the toy are provided with openings 13 through which the axle extends and which are provided with upwardly diverging side walls, these side walls constituting the guides for the axle. The point at which these inclined walls come together, that is, the apices of the triangle formed thereby, are arranged in substantially the same vertical plane with the shaft, when the latter is in its normal position. Inasmuch as the guides or side walls of the openings do not conform to the arc of a circle described about the center of the friction members but, in the present instance, are substantially straight, the distance between the axle and the friction members of the shaft is decreased as the axle travels upwardly along the inclined guides, thereby producing a wedging action between the wheels and the friction members which greatly increases the frictional contact. It is desirable, however, that some means should be provided to hold the axle against movement about a transverse axis and thus maintain the same substantially parallel with the shaft. For this purpose I have movably mounted a supplemental frame 14 upon the main frame 1. In the present instance this supplemental frame is substantially U-shaped and is pivotally mounted on the side members of the main frame at a point above and preferably in the same vertical plane with the power shaft 7, as indicated at 15. The side members of this supplemental frame are provided with openings 16 to permit the passage of the shaft and of a size sufficient to permit the shaft to have bodily movement therein either in a vertical plane or longitudinally to the toy. In the construction here shown the anti-friction disks 12 above referred to are carried by the supplemental frame and extend beyond the edge of the openings therein to form the bearings for the shaft. The side members of the supplemental frame are also provided with substantially vertical slots 17 of a width slightly greater than the diameter of the axle 6 and of a vertical length sufficient to permit the axle to have the desired vertical movement. These slots are arranged directly opposite one to the other and serve to maintain the axle against movement about a vertical axis and thereby maintain the axle parallel with the power shaft and prevent the wheels from being so displaced with reference to the friction members of the axle as to render the connection inoperative. The supplemental frame

being movably mounted on the main frame does not in any way interfere with the movement of the axle to the front or the rear of the plane of the shaft.

The operation of the device will be readily understood from the foregoing description and it will be apparent that the driving wheels are so supported as to enable them to accommodate themselves to the varying positions of the toy and further that the axle is so guided that when the toy is moved forward by hand to impart movement to the inertia wheel the axle will move rearwardly and upwardly along the rear guides, thus moving the same out of the vertical plane of the shaft and further causing the shaft to move forward slightly, thus securing a wedging action between the several parts which materially increases the frictional contact between the friction member and the periphery of the wheel. When the desired movement has been imparted to the inertia wheel and the toy is released the driving wheels will be moved forward relatively to the body portion and the axle caused to move up the forward incline, thus again securing a wedging action and increasing the frictional contact between the friction members. This forward movement of the axle relatively to the body is, of course, due to the fact that the connection between the axle and the body is a loose one and when power is applied to the wheels the axle will move forward and up the inclined guides until the pressure against the guides overcomes the inertia of the body and causes the latter to move forward with the axle. It will also be apparent that by the use of the supplemental frame having vertical slots the axle is maintained at all times in its proper position relatively to the shaft without interfering with its bodily movement along the guides, and also that by mounting the anti-friction disks upon the supplemental frame these disks are supported at all times in their proper relation to the power shaft. Further, it will be apparent that by means of this construction I secure a sufficient amount of friction by means of frictional contact with the peripheries of the one pair of driving wheels only to drive the toy not only over a level surface but up an incline, this latter being highly desirable from a commercial standpoint, it having heretofore been found necessary to utilize additional frictional contact to secure this result.

While I have herein shown and described one embodiment of my invention it will be understood that this is chosen for the purpose of illustration only and that I do not desire to be limited to the details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a toy, a frame, an axle carried by said frame and having bodily movement relatively thereto, wheels mounted on said axle, a power shaft mounted in said frame above said axle and operatively connected with said wheels, and means to guide said axle in upwardly diverging paths in the front and in the rear of the normal plane of said shaft.

2. In a toy, a frame comprising two side members, an axle carried by said frame, each side member of said frame having upwardly diverging guides for said axle, wheels mounted on said axle, and a power shaft rotatably mounted in said frame above said guide and operatively connected with said wheels.

3. In a toy, a frame comprising two side members, an axle carried by said frame, each side member of said frame having upwardly diverging guides for said axle, wheels mounted on said axle, a power shaft rotatably mounted in said frame above said guide and operatively connected with said wheels, and a supplemental frame carried by the first-mentioned frame, movably mounted on the first-mentioned frame and having slots to receive said axle and hold it against movement about a transverse axis.

4. In a toy, a frame comprising two side members, an axle carried by said frame, each side member of said frame having upwardly diverging guides for said axle, wheels mounted on said axle, a power shaft rotatably mounted in said frame above said guide and operatively connected with said wheels, and a supplemental frame pivotally mounted on the first-mentioned frame and having slots to receive said axle and maintain it substantially parallel with said shaft.

5. In a toy, a main frame comprising two side members, an axle loosely mounted on said side members, each of said side members having upwardly diverging guides for said axle, wheels mounted on said axle, a power shaft mounted in said main frame, in a vertical plane extending between said diverging guides, and operatively connected with said wheels, and a supplemental frame pivotally mounted on said main frame on an axis in substantially the same vertical plane with said shaft and having slots to receive said axle and hold it against movement about a transverse axis.

6. In a toy, a frame comprising two side members, each having an opening provided with upwardly diverging walls, a power shaft rotatably mounted in said frame in substantially the same vertical plane with the apices of said openings, an axle extending through said openings, wheels carried by said axle and operatively connected with

said shaft, and means to maintain said axle substantially parallel with said shaft.

7. In a toy, a frame comprising two side members, each having an opening provided with upwardly diverging walls, a power shaft rotatably mounted in said frame in substantially the same vertical plane with the apices of said openings, an axle extending through said openings, wheels carried by said axle and operatively connected with said shaft, and a supplemental frame movably mounted on the first-mentioned frame and having substantially vertical slots intersecting the openings in said side wall and adapted to receive said axle and hold the same substantially parallel with said shaft.

8. In a toy, a frame comprising two side members, each of which has two openings therein arranged in substantially the same vertical plane, the lowermost opening in each of said side members having upwardly diverging walls, an axle mounted in said lowermost openings and movable bodily relatively to said frame, wheels carried by said axle, a power shaft extending through the uppermost openings in said frame, operatively connected with said wheels and having movement bodily relatively to said frame, and means to maintain said axle and said shaft substantially parallel during their bodily movement.

9. In a toy, a frame comprising two side members, each of which has two openings therein arranged in substantially the same vertical plane, the lowermost opening in each of said side members having upwardly diverging walls, an axle mounted in said lowermost openings and movable bodily relatively to said frame, wheels carried by said axle, a power shaft extending through the uppermost openings in said frame, operatively connected with said wheels and having movement bodily relatively to said frame, antifriction disks extending across the upper edges of said uppermost openings to form bearings for said shaft, and a supplemental frame pivotally mounted on the first-mentioned frame and having slots to receive said axle and maintain the same substantially parallel with said shaft.

10. In a toy, a main frame comprising two side members, each of which is provided with two openings arranged one above the other, the lowermost opening in each side member having upwardly diverging walls, a supplemental frame pivotally mounted on said side members and having openings to register with the uppermost openings in said side member and having slots to intersect the lowermost openings in said side members, an axle extending through said lowermost openings in the main frame and through slots in the supplemental frame, wheels carried by said axle, an inertia shaft

- extending through the uppermost openings in the main frame and the corresponding openings in the supplemental frame, bodily movable in said openings and having friction members to engage the peripheries of said wheels and support said shaft thereon, antifriction bearings to limit the upward movement of said shaft, and an inertia wheel carried by said shaft.
11. In a toy, a main frame comprising two side members, each of which is provided with two openings arranged one above the other, the lowermost opening in each side member having upwardly diverging walls, a supplemental frame pivotally mounted on said side members above the uppermost openings therein and having openings to register with the uppermost openings in said side member and having slots to intersect the lowermost openings in said side members, an axle extending through said lowermost openings in the main frame and through slots in the supplemental frame, wheels carried by said axle, an inertia shaft extending through the uppermost openings in the main frame and the corresponding openings in the supplemental frame, bodily movable in said openings and having friction members to engage the peripheries of said wheels and support said shaft thereon, antifriction disks mounted on said supplemental frame to form bearings to limit the upward movement of said shaft, and an inertia wheel carried by said shaft.
12. In a toy, a frame comprising two side members, an axle carried by said frame, each side member of said frame having upwardly diverging guides for said axle, wheels mounted on said axle, a power shaft rotatably mounted in said frame above said guide and operatively connected with said wheels, and means to maintain said axle and said shaft substantially parallel.
- In testimony whereof, I affix my signature in presence of two witnesses.
- DAVID P. CLARK.
- Witnesses:
W. C. KENNEDY,
HARRIET L. HAMMAKER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."