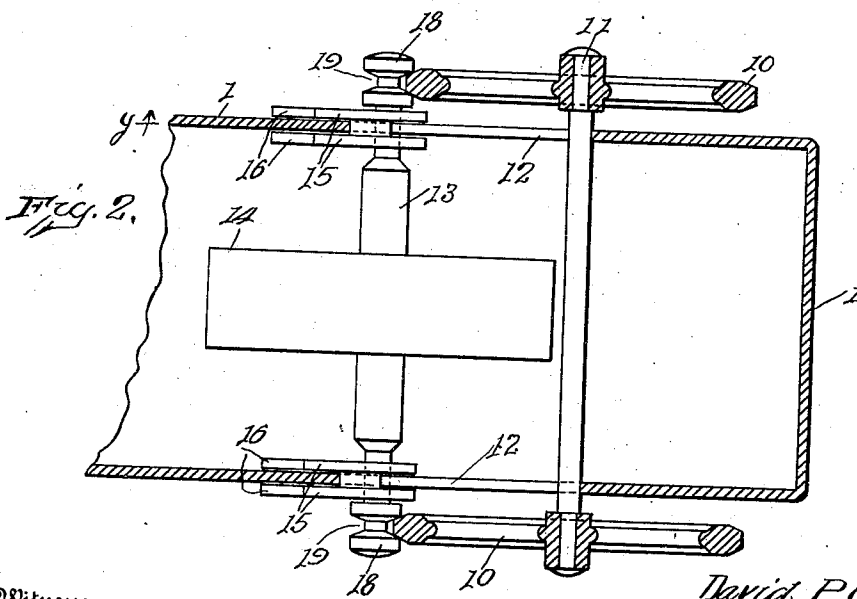
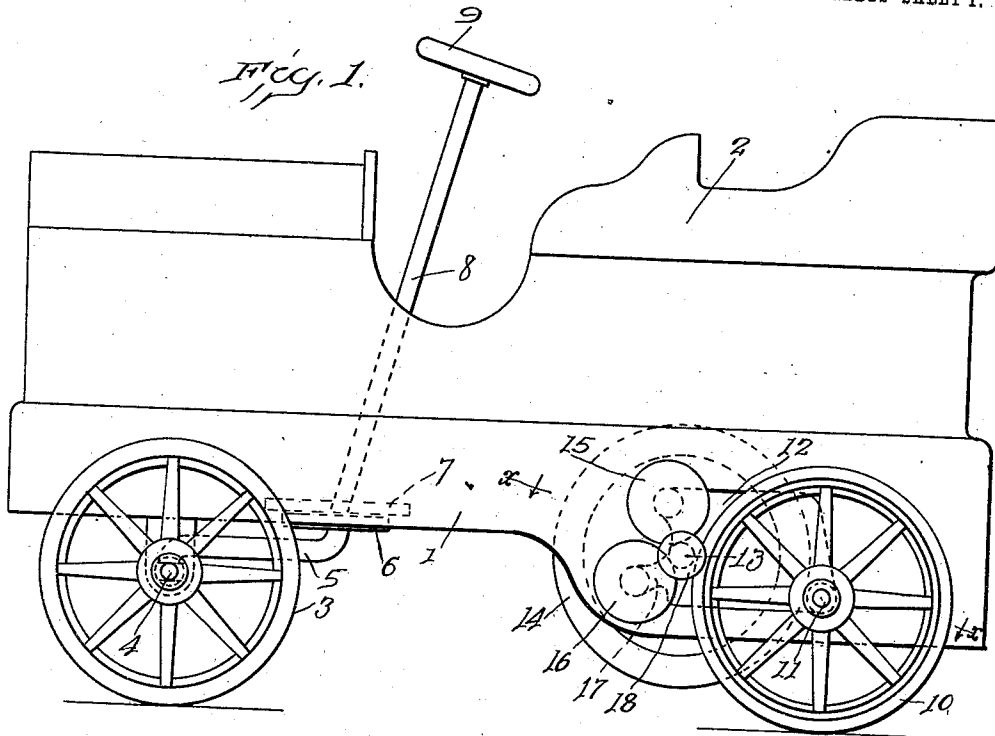


D. P. CLARK.
LOCOMOTIVE TOY.
APPLICATION FILED FEB. 26, 1910.

991,276.

Patented May 2, 1911.
2 SHEETS—SHEET 1.



Witnesses

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By

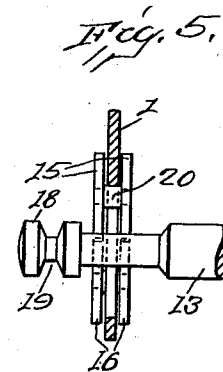
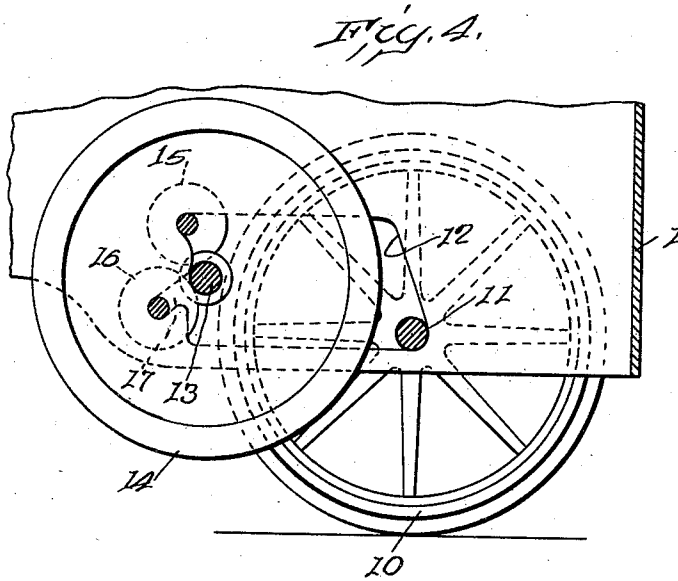
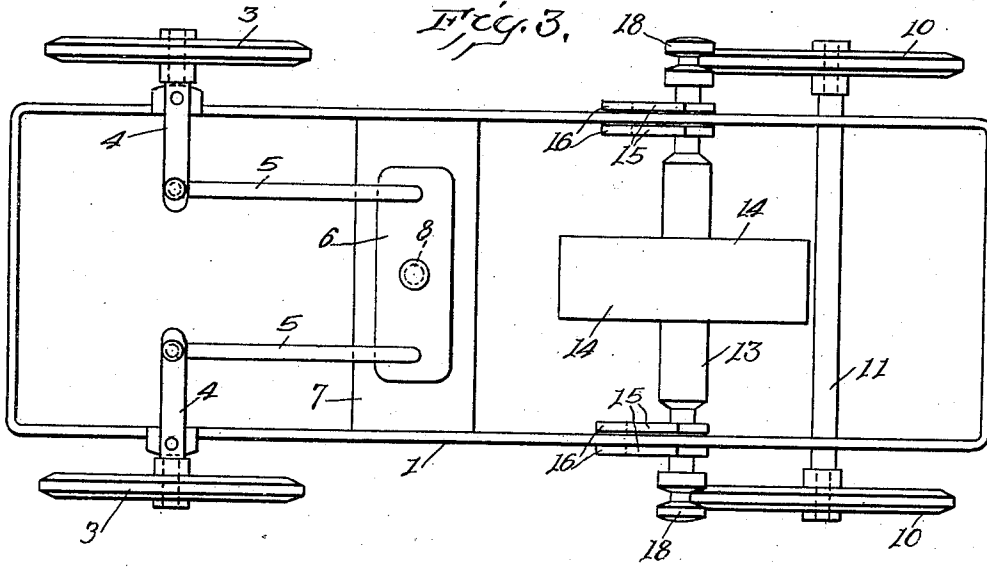
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UNITED STATES PATENT OFFICE.

DAVID P. CLARK, OF DAYTON, OHIO.

LOCOMOTIVE TOY.

991,276.

Specification of Letters Patent.

Patented May 2, 1911.

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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 Locomotive Toys, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to locomotive toys, and more particularly to that class of locomotive toys in which the power is derived from an inertia wheel.

The object of the invention is twofold; first, to mount the driving or inertia shaft in such a manner as to reduce to a minimum the frictional resistance to the rotation thereof, thus enabling a very large percent. of the power stored by the inertia wheel to be transmitted to the driving wheels of the toy and rendering the driving mechanism very sensitive; and second, to so construct and arrange the several parts of the driving mechanism of the toy that they may be quickly and easily assembled and, when so assembled, will necessarily occupy their proper positions relative one to the other, thus not only facilitating the assembling of the toy, but also eliminating all possibility of the toy being assembled in such a manner as to cause the parts to bind. To accomplish these results I form the bearings for the driving or inertia shaft of floating bearing-rollers arranged to be retained in their proper relative positions by the engagement of the shaft therewith, the shaft, in turn, being retained in engagement with the bearing rollers by means of its operative connection with the driving wheels.

In the accompanying drawings, Figure 1 is a side elevation of a toy embodying my invention; Fig. 2 is a sectional view, taken on the line *x x* of Fig. 1 and looking in the direction of the arrows; Fig. 3 is a bottom plan view of the toy shown in Fig. 1; Fig. 4 is a vertical, sectional view, taken on the line *y y* of Fig. 2 and looking in the direction of the arrows; and Fig. 5 is a detail view of one of the bearings for the driving shaft.

In these drawings I have illustrated one embodiment of my invention and have shown the same as applied to a toy comprising a main frame 1 having mounted thereon a body portion 2 of any suitable character. This body portion is, in the present instance,

shown as an imitation of the body of a typical automobile touring car and is also shown as formed integral with the main frame 1. The forward end of the main frame 1 is supported by suitable ground wheels 3 which constitute steering wheels. These steering wheels are mounted on axles 4 which, in turn, are pivotally connected to the main frame 1, to move about vertical axes. The inner ends of the pivoted axles 4 are connected by means of links or connecting rods 5 with a lever or pivoted plate 6 mounted upon a transverse frame member 7 and rigidly secured to the lower end of a steering rod 8 which is provided at its upper end with a steering wheel 9.

The rear portion of the main frame 1 is supported on ground wheels 10 which constitute driving wheels. These driving wheels are connected to the main frame in such a manner that the weight of the rear portion of the main frame and the body portion carried thereby will be supported by these wheels and will tend to force the same forward. To this end the driving wheels 10 are mounted on an axle 11 which extends through openings 12 formed in the side members of the main frame and having their rear walls inclined upwardly and forwardly and arranged to engage the axle. A driving shaft 13 extends loosely through the opposite side members of the main frame and is operatively connected to a suitable motor. This motor in the present instance is shown as comprising an inertia wheel 14 rigidly secured to the shaft 13. The openings in the side members of the main frame through which the driving or inertia shaft 13 extends may, of course, be of any suitable character and arrangement, but, as here shown, these openings are the same openings in which the axle 11 is mounted, these openings being of such a length and of such an arrangement as to permit the two members, that is, the axle and the driving shaft, to be mounted therein and to be supported in their proper relative positions.

The driving shaft 13 does not at any point engage the walls of the opening or any other fixed part of the toy. Each bearing for this shaft comprises two floating bearing-rollers, 15 and 16, loosely mounted upon the main frame and arranged in such a position as to form the bearing for the shaft 13. In the arrangement here shown each bearing-roller has an annular groove of a

width slightly greater than the thickness of the side members of the main frame and the rollers, which are in effect double bearing-rollers, are mounted on the forward wall of the opening 12 with the two parts of each roller arranged on the opposite sides of the respective frame members. The upper roller 15, of each bearing is mounted in the upper forward corner of the corresponding opening 12, the forward wall of the opening 12 being extended rearwardly a short distance to form a recess at the upper corner, within which the reduced central portion of the double bearing-roller fits. The forward wall of the opening 12 is also provided with a forwardly and downwardly inclined recess or slot 17 within which the reduced portion of the second roller of each bearing is mounted. These recesses are so arranged that when the rollers 15 and 16 are in position therein they will be spaced apart such a distance as to form a bearing for the driving shaft 13. The driving shaft 13 may be retained in engagement with the bearing rollers 15 and 16, by any suitable means, but, in order to still further reduce the friction, I prefer to retain the driving shaft in its proper position by means of the connections between it and the driving wheels 10. In the form of the device here shown these connections comprise friction members or pinions 18 rigidly secured to the outer ends of the driving shaft 13 and having formed therein annular grooves 19. The side walls of these grooves converge inwardly, that is, toward the axis of the shaft 13 and the grooves are of such a width as to receive the edges of the rims of the driving wheels. The opposite sides of these rims are preferably beveled or tapered to cause the same to present a larger contact surface to the friction member, it being noted that the relative size of the tapered rim of the driving wheels and the grooves of the friction members are such that the rim will enter the groove and present a considerable contact surface to the walls thereof, but will not come in contact with the bottom of the groove. Consequently, the forward pressure exerted upon the ground wheels by the engagement of the inclined rear wall of the opening 12 with the axle exerts a strong wedging action between these two parts and provides a very effective power transmission. The diameter of the driving wheels is such that when the axle 11 is in engagement with the inclined rear wall of the opening and the rims of the wheels are in engagement with their respective friction members or pinions 18, the driving shaft 13 will be held in engagement with the bearing-rollers 15 and 16 and these bearing rollers will, in turn, be held in their proper relative positions upon the main frame. Consequently, the driving shaft has but two contact points in

each bearing and these contact points are freely movable. These bearings offer an exceedingly small amount of frictional resistance to the rotation of the driving shaft and practically all the power generated by the inertia wheel will be delivered to the power transmission devices and by them transmitted to the driving wheels of the toy. Further, the construction of these power transmission devices is such that very little power is lost in transmission. Consequently, a very high percentage of the power generated by the motor or inertia wheel is delivered to the driving wheels.

Each of the bearing rollers 15 and 16 is here shown as comprising two disks rigidly connected one to the other by a central reduced portion or pin 20 and forms in effect a double bearing roller. It will be obvious, however, that these rollers could be constructed in different ways, the essential feature being that the two parts of the roller will be connected one to the other by a reduced portion or connecting pin. This double construction of the bearing rollers permits the same to be constructed and then loosely mounted on the main frame of the toy and eliminates the liability of the bearing rollers being connected to the main frame in such a manner as to cause the same to bind and thus offer a frictional resistance to the free rotation of the driving shaft. Further, it will be apparent that this construction is such that the device can be assembled very quickly and very easily. The bearing-rollers are dropped into their position, the driving shaft inserted and the axle and ground wheels placed in position and the only fastening devices employed are the means for retaining the ground wheels on the axles. This elimination of the use of fastening devices in the assembling of the several parts of the driving mechanism of the toy is highly important in that it eliminates the possibility of these fastening devices being inserted in such a manner as to cause friction or binding between the parts, it being apparent that one blow too many on a rivet or one turn too many on the nut of a bolt would render the connection too tight and interfere with the free movement of the parts.

When the driving mechanism is constructed and assembled in the manner described the mechanism is very sensitive and may be started in motion with a very small effort. If the toy be started up an inclined surface it will ascend the same until the power stored by the inertia wheel has been exhausted, the inertia wheel will then come to a momentary standstill and will then immediately begin to rotate in the opposite direction, permitting the toy to descend the incline. If there were even a very slight friction between the several moving parts

of the driving mechanism the toy would remain at a standstill as the gravity would not be sufficient to overcome the weight of the inertia wheel. It will be noted that the openings in the sides of the main frame form bearings upon which the floating bearing-rollers are supported and that these floating bearing-rollers are removable therefrom, in the present instance, by merely lifting them off the bearings formed by the openings.

It will further be apparent that, while I have shown and described one particular arrangement of the parts of the driving mechanism, this arrangement, as well as the detail construction of the parts can be altered without departing from the spirit of my invention. I, therefore, wish it to be understood 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 of the character described, the combination, with a main frame, an inertia wheel, an inertia wheel shaft loosely mounted on said main frame, bearing rollers loosely mounted on said main frame and forming bearings for said inertia wheel shaft, said inertia wheel shaft being arranged to engage said bearing rollers at such points that said shaft will retain said bearing rollers in their proper positions, and friction pinions carried by said inertia wheel shaft, of an axle, driving wheels mounted on said axle and arranged to engage the respective friction pinions, and an inclined bearing surface carried by said main frame and arranged to engage said axle to support a portion of said main frame thereon and to exert a pressure on said axle in the direction of said inertia wheel shaft.

2. In a toy of the character described, the combination, with a main frame having openings in each side thereof, each of said openings having its rear wall inclined upwardly and forwardly, of an inertia wheel, an inertia wheel shaft extending through said openings, floating bearing-rollers arranged at the forward end of each of said openings and forming bearings for said inertia wheel shaft, an axle extending through said openings and arranged to engage the inclined rear walls thereof, and driving wheels mounted on said axle and arranged in contact with said friction pinion.

3. A toy of the character described comprising a frame member having an opening therein, an inertia wheel having its shaft extending through said opening, a double

bearing-roller loosely mounted on said frame member, extending beyond the edge of said opening and arranged to be engaged by said shaft, and a driving wheel retaining said roller and receiving rotary motion from said inertia wheel shaft.

4. A toy of the character described comprising a frame member having an opening, an inertia wheel having its shaft extending through said opening, two bearing rollers arranged at one end of said opening, one of said rollers comprising two disks connected one to the other by a reduced member, the two disks of each bearing roller being arranged on opposite sides of said frame member and said bearing rollers being arranged to form a bearing for said shaft, and a driving wheel retaining said shaft in engagement with said bearing rollers and receiving rotary motion therefrom.

5. In a toy of the character described, the combination, with a frame, of driving wheels mounted on an axle having bearings in said frame, an inertia wheel having its shaft in engagement with said driving wheels, and floating bearing-rollers mounted in said frame and engaging the inertia wheel shaft.

6. In a toy of the character described, the combination, with a frame, of driving wheels mounted on an axle having bearings in said frame, an inertia wheel having its shaft in frictional engagement with said driving wheels, and floating bearing-rollers mounted in said frame and engaging the inertia wheel shaft.

7. In a toy, a frame having an opening to form a floating bearing, and a bearing roller removably mounted in said opening, an inertia wheel having its shaft extended through said opening and engaging said bearing roller, and a driving wheel supporting a portion of said frame and receiving rotary motion from said inertia wheel shaft.

8. In a toy, a frame having an opening forming a floating bearing, and a plurality of bearing rollers removably mounted in said opening, an inertia wheel having its shaft extended through said opening and engaging said bearing rollers, and a driving wheel supporting a portion of said frame and receiving rotary motion from said inertia wheel shaft.

In testimony whereof, I affix my signature in presence of two witnesses.

DAVID P. CLARK.

Witnesses:

BESSIE D. MOORE,
S. W. JAMES.