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TOY.

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1,319,040.

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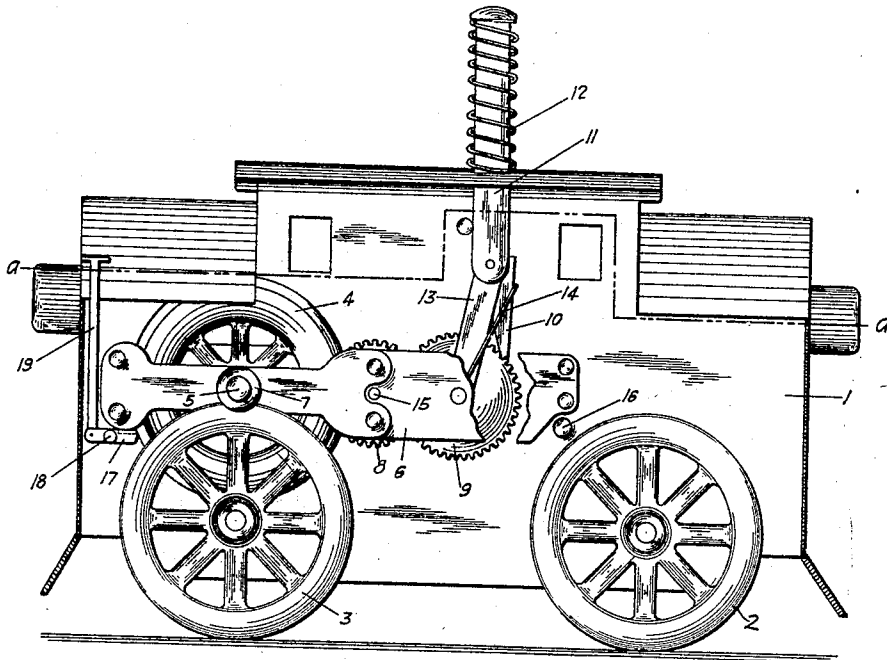


Fig. 1

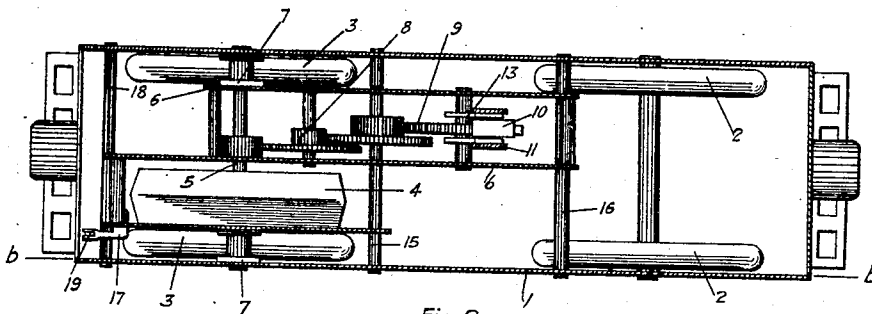


Fig. 2

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To all whom it may concern:

Be it known that I, CHARLES F. BLACK, 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 Toys, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to toys and more particularly to self propelled toys in which the energy is stored in an energy storing device, and then transmitted to the driving wheels.

One object of the invention is to provide a toy of this kind in which the energy storing device may be actuated independently of the driving wheels to store power therein.

Another object of the invention is to provide such a toy in which the actuating device for storing energy will automatically disconnect the energy storing device from the driving wheels.

A further object of the invention is to provide such a toy having means for disconnecting the energy storing device from the driving wheels during the intervals between successive operations of the means for actuating the energy storing device.

Other objects of the invention will appear as the mechanism is described in detail.

Figure 1 is a sectional view of a toy embodying my invention taken on the line *b-b* of Fig. 2; and Fig. 2 is horizontal section taken on the line *a-a* of Fig. 1.

In these drawings I have illustrated one embodiment of my invention and have shown the same as applied to a toy, the body portion 1 of which is constructed to represent an electric locomotive. This toy is mounted on ground wheels 2 and 3, the rear ground wheels 3 constituting driving wheels to which power is transmitted from a suitable energy storing device, such as an inertia wheel 4, which is carried by a shaft 5 journaled in a supplemental frame 6 and having its ends projecting beyond the sides of the frame and provided with friction pinions 7 which engage the rims of the driving wheels 3 and transmit energy thereto. It will be understood, however, that this mechanism has been chosen for the purpose of illustration only, and that the invention may be embodied in toys of various kinds, the

body portions of which may be made to represent various vehicles, or other objects. Further, any suitable energy storing device may be employed and the power may be transmitted to the driving wheels through any suitable connecting devices.

In the operation of the device energy is stored in the inertia wheel by rotating the same at a high rate of speed, and this is accomplished through a train of multiplying gearing 8. This train of gearing is actuated by means of a suitable actuating device which can be operated independently of the driving wheels and, in the present construction, the initial gear 9 of the train of gearing is acted upon by a pawl 10 which is preferably connected with a plunger 11 extending beyond the housing or body of the toy and, in the present instance, arranged vertically and extending through the top of the body portion of the toy. A spring 12 serves to return the plunger 2 and retain the same normally in its outermost position. The plunger is guided by means of links 13 pivotally connected at one end to the inner end of the plunger and at the other end to the frame 6 on the axis of the toothed actuating member or gear 9. A spring 14 serves to hold the pawl normally in engagement with the toothed driving member 9 and it will be apparent that upon each inward movement of the plunger the toothed actuating member 9 may be rotated and movement will be transmitted, through the train of multiplying gearing 8, to the shaft 5 and inertia wheel 4.

In order that the most efficient operation may be had, it is desirable that the power transmitting devices or friction pinions 7 be held out of engagement with the driving wheels 3 while energy is being stored in the inertia wheel. In the present construction I have provided means for automatically accomplishing this result, which means is of such a character that it will be actuated by the plunger 11 upon each operation thereof. In the construction here illustrated, the frame 6 is pivotally supported between the axis of the toothed actuating member 9 and the axis of the inertia wheel. Consequently, the pressure which is exerted upon the one end of the frame by the plunger when the latter is actuated will rock the frame about its axis and elevate the in-

ertia wheel, together with its shaft and power transmitting pinions 7. The supplemental frame 6 may be mounted in any suitable manner, but preferably a shaft 15 extends through the same and is mounted in the side walls of the body of the toy. A stop 16 serves to limit the rocking movement of the frame. The weight of the inertia wheel and other mechanism at that end of the frame opposite the toothed actuating member 9 is sufficient to automatically return the frame to its normal position, and thus bring the power transmitting pinion 7 into frictional contact with the driving wheels, as the pressure on the plunger 11 is relieved. Consequently, the toy can be set in operation by thrusting the plunger inwardly and then releasing the same. The train of gearing is of such a ratio that a single operation of the plunger will cause the inertia wheel to be rotated at a high speed. It is sometimes desired, however, to impart repeated impulses to the inertia wheel in order that a larger amount of power may be stored therein, and to accomplish this most efficiently, it is necessary that the transmitting pinions 7 be maintained out of engagement with the driving wheels 3 during the interval between the operations of the plunger. I have, therefore, provided the toy with a manually operated device by means of which the frame 6 may be rocked about its axis to move the pinions into their inoperative positions and to retain them in those positions. This device is of such a character that it can be actuated by one hand of the operator while the plunger is actuated by the other hand of the operator. As here shown, a cam lever 17 is mounted on a shaft 18, which in turn is mounted in the frame or body of the toy, and has a part extending beneath the rear end of the supplemental frame 6. A finger piece, which, in the present instance, is shown in the form of a rod or plunger 19, is connected with the cam lever 17 and extends through the body of the toy into a position in which it is readily accessible for operation.

The operation of the toy will be readily understood from the foregoing description, and it will be apparent that I have provided means whereby energy may be stored in the inertia wheel independently of the driving wheels, thus doing away with the necessity of mounting the driving wheels for vertical movement and then moving the toy as a whole over the floor or other supporting surface to actuate the inertia wheel. With my device the only action on the part of the operator necessary to set the toy in motion is to thrust the plunger 11 inwardly and then release it. This action disconnects the inertia wheel

from the driving wheels and imparts movement thereto. If a higher speed of rotation is desired in the inertia wheel, repeated impulses may be imparted thereto by repeated operations of the plunger, and the inertia wheel may be disconnected from the driving wheels during the interval between these impulses by means of the cam lever 17 and its actuating member. The device is very simple in its construction and is of such a character that the parts can be easily made and assembled, thus enabling the toy to be produced at a relatively low cost.

While I have shown and described one embodiment of the invention, I wish it to be understood that I do not desire to be limited to the details thereof, as various modifications may 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, driving wheels, an inertia wheel, means for transmitting power from said inertia wheel to said driving wheels, a train of gearing connected with said inertia wheel and comprising a toothed actuating member, a pawl cooperating with said toothed actuating member, and means for actuating said pawl.

2. In a toy of the character described, driving wheels, an inertia wheel, means for transmitting power from said inertia wheel to said driving wheels, a train of gearing connected with said inertia wheel and comprising a toothed actuating member, a pawl cooperating with said toothed actuating member, and a reciprocatory plunger operatively connected with said pawl.

3. In a toy of the character described, driving wheels, an inertia wheel, means for transmitting power from said inertia wheel to said driving wheels, a train of gearing connected with said inertia wheel and comprising a toothed actuating member, a pawl cooperating with said toothed actuating member, a reciprocatory plunger connected with said pawl, a link connected at one end to said plunger and pivotally mounted at the other end on the axis of said toothed actuating member.

4. In a toy of the character described, driving wheels, an energy storing device, means for transmitting power from said energy storing device to said driving wheels, means for actuating said energy storing device, to cause energy to be stored therein, comprising a toothed actuating member, a plunger and a pawl carried by said plunger and engaging said toothed actuating member.

5. In a toy of the character described, driving wheels, an energy storing device, means for transmitting power from said energy storing device to said driving wheels, means

for actuating said energy storing device, to cause energy to be stored therein, comprising a toothed actuating member, a reciprocatory plunger, a link connected at one end to said plunger and pivotally mounted at the other end on the axis of said toothed actuating member, and a pawl connected with said plunger and engaging said toothed actuating member.

6. In a toy of the character described, driving wheels, an energy storing device, means for operatively connecting said energy storing device with said driving wheels, and means for actuating said energy storing device to cause energy to be stored therein and for automatically disconnecting the same from said driving wheels while it is being so actuated.

7. In a toy of the character described, driving wheels, an energy storing device, means for operatively connecting said energy storing device with said driving wheels, an actuating device to cause energy to be stored in said energy storing device, and means controlled by said actuating device to disconnect said energy storing device from said driving wheels while energy is being stored in said device.

8. In a toy of the character described, driving wheels, an energy storing device, means for operatively connecting said energy storing device with said driving wheels, and a single device for actuating said energy storing device, to cause energy to be stored therein, and for disconnecting said energy storing device from said driving wheels.

9. In a toy of the character described, driving wheels, an energy storing device, power transmitting devices to operatively connect said energy storing device with said driving wheels, means for actuating said energy storing device, to cause energy to be stored therein, and for automatically moving said power transmitting devices into inoperative positions with relation to said driving wheels.

10. In a toy of the character described, driving wheels, an energy storing device, power transmitting devices to connect said energy storing device with said driving wheels, a movable member connected with said power transmitting devices to move the same into and out of operative relation with said driving wheels, an actuating device to cause energy to be stored in said energy storing device and to impart movement to said movable member to cause said power transmitting devices to be moved into their inoperative positions.

11. In a toy of the character described, driving wheels, an energy storing device, power transmitting devices to connect said energy storing device with said driving wheels, a tiltable member connected with said power transmitting devices to move the

same into and out of operative relation with said driving wheels, an actuating device to cause energy to be stored in said energy storing device and to tilt said tiltable member to move said power transmitting devices into their inoperative positions.

12. In a toy of the character described, driving wheels, a supplemental frame pivotally mounted on said toy, an energy storing device carried by said frame, power transmitting devices carried by said frame and movable into and out of operative relation with the respective driving wheels, an actuating device for said energy storing device, said actuating device being operatively connected with said pivoted frame to rock the same and cause said power transmitting devices to be moved into their inoperative positions.

13. In a toy of the character described, driving wheels, a frame pivotally mounted on said toy, an inertia wheel journaled on said frame, power transmitting devices connected with said inertia wheel and adapted to be moved into and out of relation with the respective driving wheels by the pivotal movement of said frame, an actuating member mounted on said frame and having geared connection with said inertia wheel, and means for imparting movement to said actuating member and for rocking said frame about its axis.

14. In a toy of the character described, driving wheels, a frame pivotally mounted on said toy, an inertia wheel journaled on said frame, power transmitting devices connected with said inertia wheel and adapted to be moved into and out of operative relation with the respective driving wheels by the pivotal movement of said frame, a toothed actuating member mounted on said frame on that side of its axis opposite said inertia wheel and having geared connection with said inertia wheel, a plunger, and a pawl carried by said plunger and engaging said toothed actuating member, whereby the manipulation of said plunger will rock said frame to move said power transmitting devices into their inoperative positions and will impart movement through said toothed actuating member to said inertia wheel.

15. In a toy of the character described, driving wheels, a frame pivotally mounted on said toy, an inertia wheel journaled on said frame, power transmitting devices connected with said inertia wheel and adapted to be moved into and out of operative relation with the respective driving wheels by the pivotal movement of said frame, a toothed actuating member mounted on said frame on that side of its axis opposite said inertia wheel and having geared connection with said inertia wheel, a plunger, and a pawl carried by said plunger and engaging said toothed actuating member, whereby the ma-

nipulation of said plunger will rock said frame to move said power transmitting devices into their inoperative positions and will impart movement through said toothed
5 actuating member to said inertia wheel, and means to retain said power transmitting devices in their inoperative positions during successive operations of said plunger.

16. In a toy of the character described,
10 driving wheels, a frame pivotally mounted on said toy, an inertia wheel journaled on said frame, power transmitting devices connected with said inertia wheel and adapted to be moved into and out of operative relation with the respective driving wheels by
15 the pivotal movement of said frame, a toothed actuating member mounted on said frame on that side of its axis opposite said inertia wheel and having geared connection
20 with said inertia wheel, a plunger, and a pawl carried by said plunger and engaging said toothed actuating member, whereby the manipulation of said plunger will rock said frame to move said power transmitting de-
25 vices into their inoperative positions and will impart movement through said toothed actuating member to said inertia wheel, a pivotally mounted cam arm having its free end in engagement with a part of said

frame, and a finger piece connected with 30 said cam arm.

17. In a toy of the character described, driving wheels, an energy storing device, power transmitting devices to operatively connect said energy storing device with said
35 driving wheels, an actuating device to impart movement to said energy storing device and to move said power transmitting devices into inoperative positions with relation to said driving wheels, and means 40 other than said actuating device to retain said power transmitting devices in such inoperative positions during successive operations of said actuating device.

18. In a toy of the character described, 45 driving wheels, a pivoted frame, an inertia wheel carried by said pivoted frame, friction pinions carried by said frame and movable into and out of operative relation with said driving wheels, an actuating device to
50 impart movement to said inertia wheel, and other means for rocking said pivoted frame about its axis to move said friction pinions into inoperative positions with relation to said driving wheels. 55

In testimony whereof I affix my signature hereto.

CHARLES F. BLACK.

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