July 29, 1924. 1,503,009

E. S. SAVAGE

TOY VEHICLE

Filed May 21, 1921 2 Sheets-Sheet 1

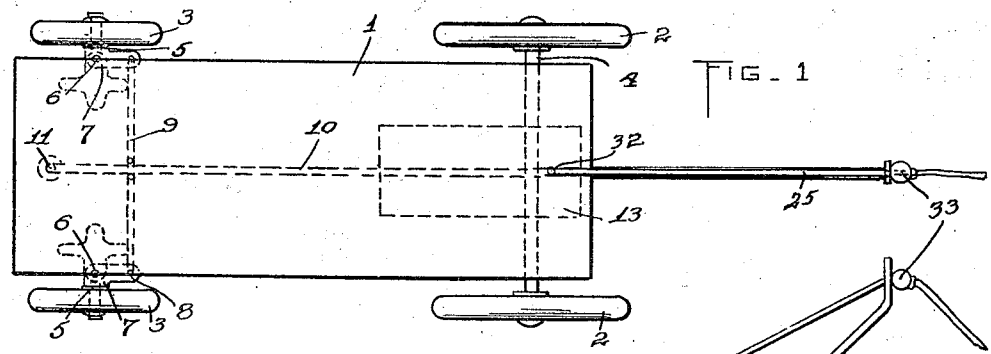


FIG. 1

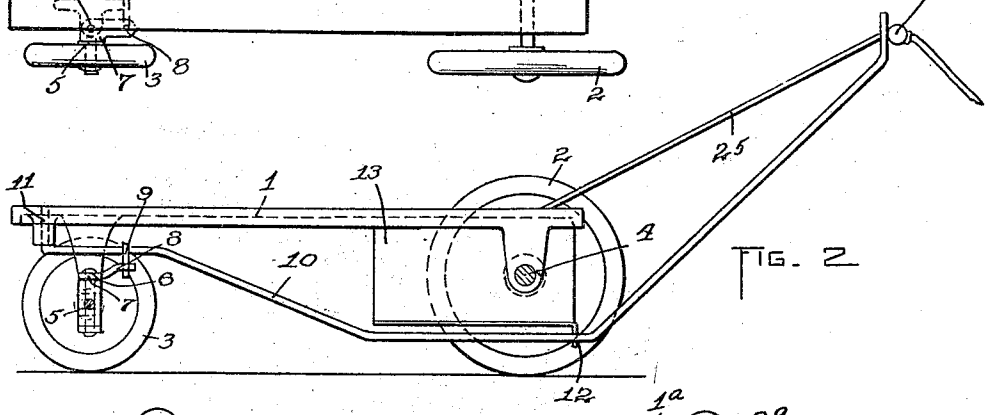


FIG. 2

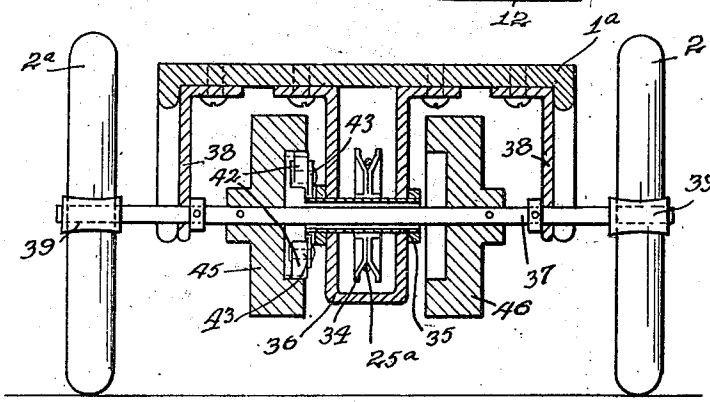


FIG. 3

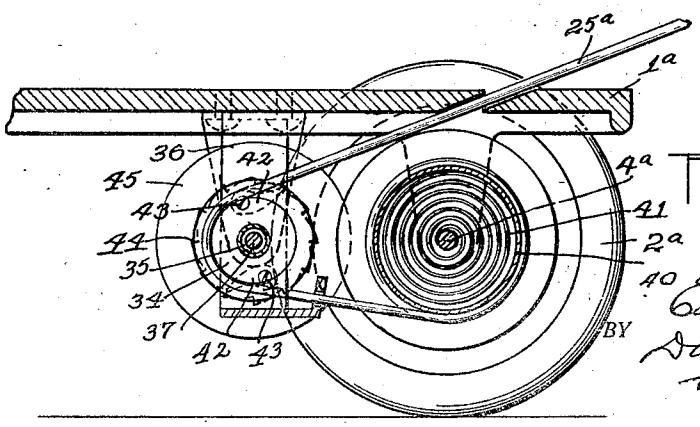


FIG. 4

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FIG. 5

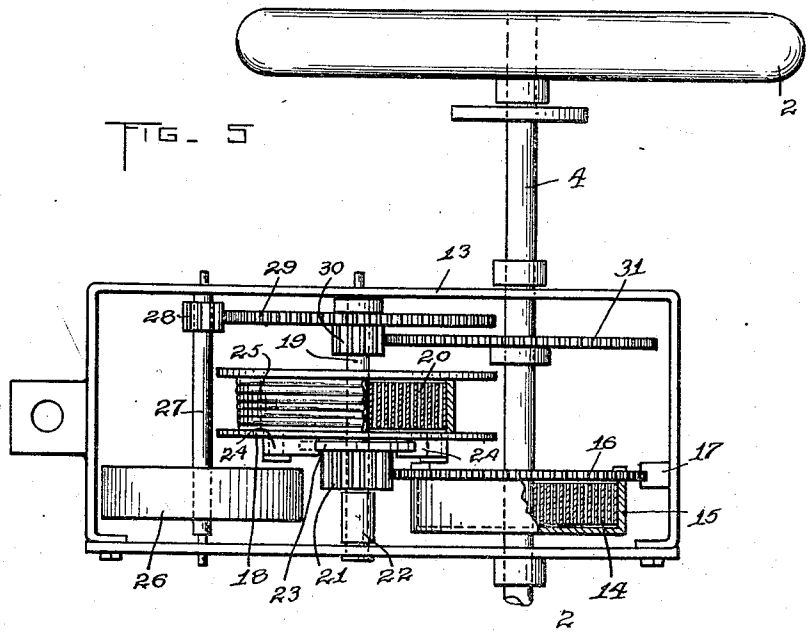
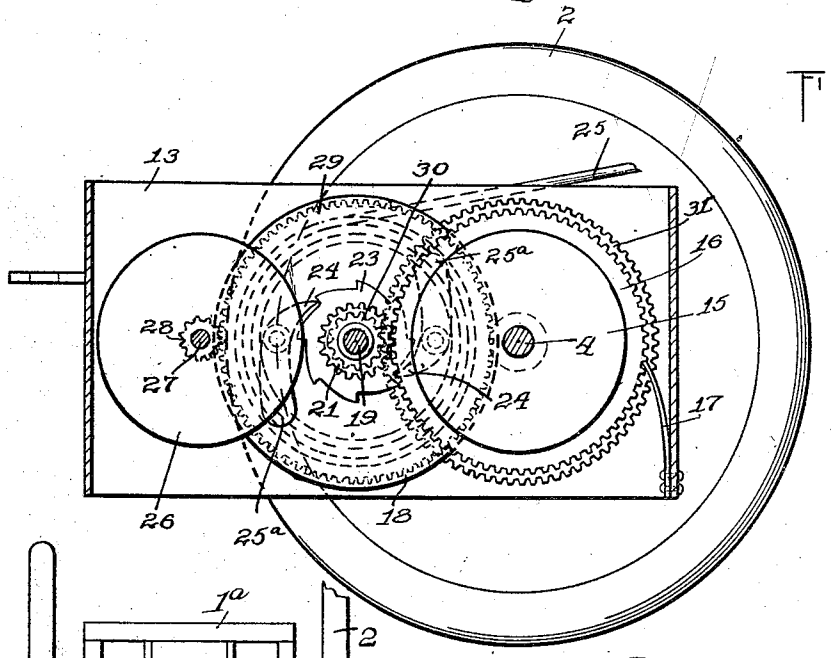


FIG. 6



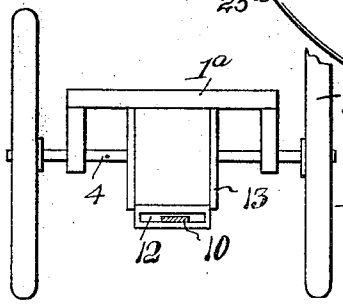


Fig. 7.

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Patented July 29, 1924. 1,503,009

UNITED STATES PATENT OFFICE.

EDWARD S. SAVAGE, OF ROCHESTER, NEW YORK.

TOY VEHICLE.

Application filed May 21, 1921. Serial No. 471,402.

To all whom it may concern:

Be it known that I, EDWARD S. SAVAGE, a citizen of the United States, and resident of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Toy Vehicles, of which the following is a specification.

The present invention relates to toy vehicles and an object thereof is to provide a toy vehicle which may be propelled from a cable or other flexible connection extending from the rear of the vehicle. Another object of the invention is to provide a toy vehicle which may be propelled and steered through a common device. A still further object of the invention is to provide a toy vehicle which may be propelled by successive pulls on a flexible connection extending from the rear thereof and may be steered by a lateral shifting of said connection while in a taut condition.

To these and other ends the invention consists of certain parts and combinations of parts, all of which will be hereinafter described, the novel features being pointed out in the appended claims.

In the drawings:

Fig. 1 is a plan view of a vehicle constructed in accordance with this invention;

Fig. 2 is a side view of said vehicle;

Fig. 3 is a vertical section through another embodiment of the invention;

Fig. 4 is a vertical longitudinal section through the embodiment shown in Fig. 3;

Fig. 5 is a horizontal section through the embodiment shown in Figs. 1 and 2;

Fig. 6 is a vertical section through such embodiment, and

Fig. 7 is a rear view of the vehicle illustrated in Fig. 2.

Referring more particularly to the drawings, 1 indicates the body of the vehicle which may be of any form and supported upon wheels, two of which are in this instance, in the form of two rear or driving wheels 2 and two in the form of steering or forward wheels 3, the driving wheels being mounted upon an axle 4 while the steering wheels are mounted upon spindles 5 pivoted at 6 to brackets 7 and each having an arm 8 extending rearwardly therefrom, these arms being connected by a steering rod 9. The steering of the vehicle is secured by providing a steering lever or member 10 pivoted at 11 to the body in front of the steering rod 9 and extending rearwardly from the body, being guided at 12 in a guideway formed on the under side of the casing 13 which is supported on the under side of the body and encloses the propelling mechanism, the steering member or lever 10 being extended rearwardly and upwardly from the body.

The propelling means of the embodiment shown in Figs. 1 and 2 is shown in Figs. 5 and 6 and comprises a spring motor in a volute spring 14 secured at one end to the axle or drive shaft 4 enclosed within a housing 15 to which the other end of the spring is secured. This housing turns on the shaft and has one side closed by a gear 16 with which a spring detent 17 cooperates.

For storing energy in this spring motor there is provided a drum 18 which is mounted to turn upon a shaft 19 and has within it a volute spring 20, one end of which is secured to the shaft 19, while the other end is secured to the drum. Also turning on the shaft 19 is a pinion 21 spaced from the side of the frame 13 by a sleeve 22 on the shaft, the pinion 21 meshing with the gear 16. A pawl and ratchet connection is provided between the drum 18 and the gear 21. In this instance, this pawl and ratchet connection comprises a ratchet 23 rigid with the gear 21 and engaged by pawls 24 mounted on the drum 18, these pawls having weighted ends 25^a which, when the drum is rotated, are thrown outwardly by centrifugal force so as to engage with the ratchet 23. The movement of the drum is effected through a cable or flexible connection 25 which is held wrapped about the drum by the spring in the latter, the pulling of the cable tending to store up energy in the spring 20 due to the rotation of the drum 18 on the shaft 19. This pulling of the cable 25 transmits motion from the drum to the gear 21 through the pawls 24 and ratchet 23, the motion of the gear 21 being communicated to the gear 16 to store up energy in the spring 14 so as to drive the shaft 4 from said spring.

In order that the spring 14 may be controlled, a governor may be provided preferably in the form of a fly wheel 26 on a shaft 27 which also has a pinion 28 meshing with a gear 29 turning loosely on the shaft 19 and connected rigidly to a pinion 30 which in turn meshes with a gear 31 rigidly secured to the shaft or axle 4. The

cable or flexible connection 25 extends rearwardly from the vehicle preferably through an opening 32 in the body and this cable preferably also leads through an opening in the steering member 10, a ball 33 being provided on the cable or flexible connection for limiting the winding of the cable on the drum.

In the operation of this embodiment of the invention, the user of the toy stands in the rear of the latter and gives successive pulls on the cable 25. This stores up energy in the motor spring 14 which is transmitted to the wheels 2 to propel the vehicle. As the cable 25 connects with the steering member 10, the vehicle may also be steered through the propelling cable, this being effected by holding the cable taut and pulling such cable laterally in the direction in which it is desired that the vehicle should turn.

In the embodiment shown in Figs. 3 and 4, the steering mechanism is identical with that shown in Figs. 1 and 2, the difference being in the propelling mechanism of the vehicle. Instead of employing a spring motor, a momentum motor is employed. In this embodiment the wheels 2^a turn loosely on the shaft 4^a which is supported against turning on the body 1^a. A cable 25^a passes about a drum 34 which is mounted on a hollow shaft 35, the latter being journalled in a U shaped bracket 36 depending from the under side of the body 1^a. Extending through this hollow shaft 35 is a drive shaft 37 which is journalled in brackets 38 depending from the body 1^a and has beyond said brackets friction drive wheels 39 which frictionally engage the peripheries of the rear wheels 2^a in the manner shown in Fig. 3. The cable 25^a leads about the drum 34 and connects with a winding drum 40 which is mounted to turn on the shaft 4^a and encloses a volute spring 41, one end of which is secured to the shaft 4^a while the other end is secured to the drum 40. It is apparent that pulling upon the cable 25^a will rotate the drum 34 and turn the drum 40 to tension the spring 41. When the cable 25^a is released the spring 41 will re-wind the cable on the drum 40. Driving connection between the hollow shaft 35 and the drive shaft 37 is established through the provision of centrifugally operated pawls 42 pivoted at 43 to the hollow shaft 35 and adapted to cooperate with internal teeth 44 formed on a fly wheel 45 which is mounted upon the shaft 37. A second fly wheel 46 is also mounted on said shaft in symmetrical relation with the fly wheel 45 to the drum 34. It is apparent that, when the drum 34 is turned upon successive pulls of the cable 25^a, the rotation of the drum 34 will, through the pawl and ratchet device, be communicated to the drive shaft 37, thus causing the turning of the ground wheels 2^a. The fly wheels 45 and 46 provide a momentum motor in which energy is stored through the cable for the purpose of keeping the vehicle in continuous motion.

From the foregoing it will be seen that there has been provided a toy vehicle which is propelled from the rear through a flexible connection. This flexible connection leads about a spring drum and after each successive pull thereon, is re-wound on the drum. Through the flexible connection, motion is transmitted to the wheels of the vehicle preferably through a propelling mechanism which maintains substantially continuous motion in the vehicle during the time when the flexible connection is being wound on the drum. There is also provided a vehicle which is propelled and steered through a common member preferably in the form of a flexible connection leading from the rear of the vehicle.

What I claim as my invention and desire to secure by Letters Patent is:

1. A wheeled toy vehicle comprising a steering mechanism, a propelling mechanism, and a cable connected with the propelling mechanism for effecting the propelling of the vehicle through a longitudinal movement of the cable and connected with the steering mechanism between its ends to cause the latter to shift when the cable is moved laterally from a point beyond the connection with the steering mechanism.

2. A wheeled toy vehicle comprising a body, a steering member for the toy vehicle, a propelling mechanism, and a cable connected with the propelling mechanism to effect the propelling of the vehicle through the longitudinal movement of the cable having a sliding connection with the steering member between its ends permitting the cable to move longitudinally independently of the steering mechanism and causing the steering mechanism to shift laterally with the cable when the latter is moved laterally from a point beyond such connection.

3. A wheeled toy vehicle comprising a body, a propelling mechanism, a steering member extending rearwardly from the body, and a cable connected with the propelling mechanism to effect the propelling of the vehicle through a longitudinal movement of such cable, said cable extending rearwardly from the body and having sliding connection with the steering member between its ends so that a lateral movement of the cable in rear of such connection will effect the lateral movement of the steering member and the steering of the vehicle.

4. A toy vehicle comprising a body, rear driving wheels, front steering wheels, a steering member connected to the front steering wheels and projected rearwardly in rear of the rear wheels, said steering

member being movable laterally, a propelling mechanism connected to the rear wheels, and a cable connected to the propelling mechanism and having a loose connection with the steering member, permitting the cable to move longitudinally independently of the steering member and causing the steering member to shift laterally as the cable is shifted laterally.

5. In a toy vehicle, a propelling mechanism comprising a spring motor connected to the wheels of the vehicle, a spring drum, a cable arranged to be wound on the spring drum by the spring thereof, and a ratchet connection between the spring drum and the spring motor whereby successive pulls on the cable are transmitted to the spring motor to store energy therein.

6. In a toy vehicle, a propelling mechanism comprising a spring motor connected with the vehicle to drive the same, a spring drum having a pawl and ratchet connection with the spring motor to store energy in such motor, and a cable connected with said spring drum to effect the movement of the latter to store energy in the spring motor through successive pulls on said cable.

7. A toy vehicle comprising a body, driving wheels, a spring motor connected to said driving wheels and having a gear, a gear meshing with the gear of the spring motor, a spring drum mounted to turn about an axis coincident with the axis of turning of the second mentioned gear, a pawl and ratchet connection between the second mentioned gear and the spring drum, and a cable connected to the spring drum to operate the latter through successive pulls thereon for storing energy in the spring motor.

EDWARD S. SAVAGE.