

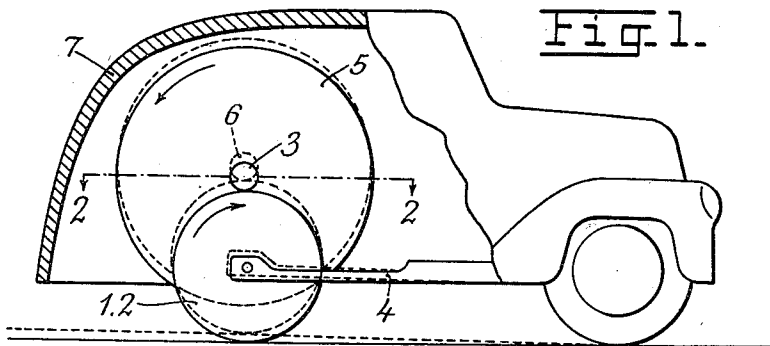
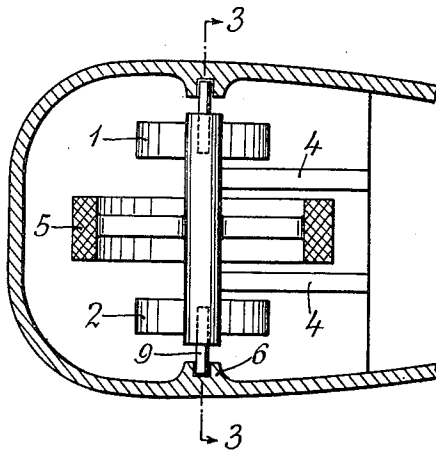
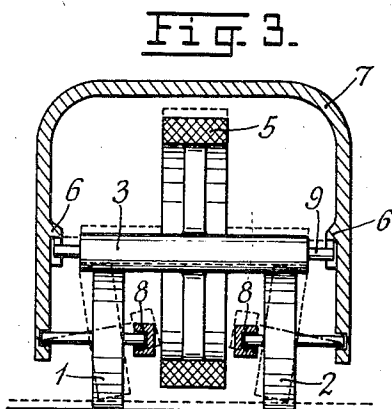
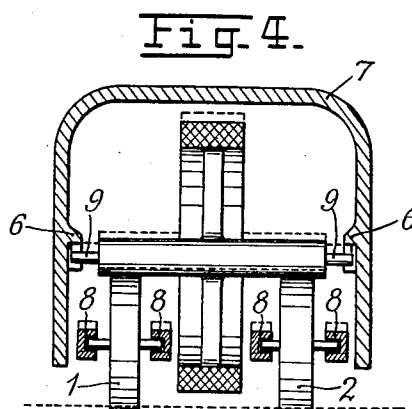
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FLYWHEEL PROPELLED TOY VEHICLE

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FLYWHEEL PROPELLED TOY VEHICLE

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2 Claims. (Cl. 46—209)

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This invention relates to toy vehicles of the type in which a flywheel with a hub or with a smaller wheel rests upon the circumference of one or two of the running wheels of the vehicle, said wheels being driven by friction when the flywheel is set in rotation.

Hitherto, in toys of this type, it has been proposed to maintain flywheel trunnions in engagement with a disc with a comparatively high force. The applied rotation of the flywheel was thereby considerably reduced, so that the time during which it could rotate, due to acquired kinetic energy, was correspondingly reduced. In another proposal the flywheel trunnions were subjected to an additional pressure, which corresponded to a substantial proportion of the vehicle weight and increased the friction upon the flywheel trunnions.

The object of the present invention is to obviate or mitigate the disadvantages specified above.

According to the present invention I provide a toy vehicle of the type referred to in which at least one trunnion of the flywheel is movable upwardly and downwardly in bearings which limit the upward movement, and at least one of the running wheels is also movable upwardly and downwardly, but tending to move downwardly relative to the flywheel by downwardly-directed spring action whereby, when downward pressure is applied upon the vehicle body, the running wheel is adapted to rise together with the flywheel and be stopped in this motion by the said limitation of the flywheel trunnion or trunnions, whereupon the vehicle is moved rapidly backwards or forwards upon the running wheels, the flywheel is rotated and acquires kinetic energy, the vehicle body is set free, and the kinetic energy of the flywheel drives the vehicle.

Embodiments of the invention will now be described, by way of example, with reference to the accompanying drawing, in which:

Fig. 1 is a vertical longitudinal section of the rear portion of a toy vehicle; Fig. 2 is a sectional plan view on the line 2—2 of Fig. 1 and showing the embodiment of Fig. 3; Fig. 3 is a vertical cross section on the line 3—3 of Fig. 2; Fig. 4 illustrates an alternate embodiment of the invention.

Referring to the drawing, horizontal rearwardly-directed springs or flexibly mounted fingers 4 are fixed to the vehicle casing or body 7. The rear ends thereof yield upwardly and downwardly and form bearings 8 for the trunnions of the rear running traction wheels 1 and 2 of the vehicle, upon the circumference of which wheels

the shaft 3 rests with the weight of a flywheel 5, in addition to its own weight and that of trunnions 9. The shaft trunnions 9 project into slots or bearings 6 in the side walls of the vehicle casing. The bearings are elongated in a vertical direction and open downwards, but are limited upwards. Traction wheels are supported by body 7 at the forward end thereof.

Figs. 3 and 4 of the drawings illustrate two different embodiments of the invention. The running wheels are denoted 1 and 2. In the embodiment of Fig. 3 the outer trunnions of the running wheels are journaled on the inside in the vehicle body and the inner trunnions are journaled in the bearings 8 of the springs 4. In the embodiment of Fig. 4 the trunnions on both sides of the running wheels are journaled in the bearings 8 of the springs 4. The springs 4 permit sufficient freedom of action for the running wheels that they can be moved upwardly and downwardly either in substantially vertical direction as shown in the embodiment in accordance with Fig. 4, or tilted about a horizontal axis as shown in Fig. 3.

When no force is applied to the vehicle, the running wheels 1 and 2 occupy their lower position, shown in Fig. 1 by a circle drawn with full lines. The flywheel shaft 3 then rests with its weight and that of the flywheel 5 upon the topmost part of the circumference of the running wheels, and the trunnions 9 of the shaft 3 do not project up into the upper limitations of the bearing openings 6 since the springs or fingers 4 in this situation raise the body with respect to said trunnions.

When the vehicle is to be put in motion, the vehicle casing 7 is pressed down, whereby the end portions of the springs 4 with the bearings 8 are bent, and the running wheels move the shaft 3 (or its trunnions 9) into the upper limitations of the bearings 6 and against the tops thereof (dotted lines in Fig. 1). The vehicle is then moved rapidly backwards or forwards on its running surface, whereby flywheel 5 is set in rapid rotation. The vehicle is then freed, whereby the springs 4 lift the vehicle casing 7 upwards back to the position shown in full lines in Fig. 1, so that the shafts 3 (or its trunnions 9) no longer projects into the upper limitations of the opening of the bearings 6 and no longer contacts their tops.

The flywheel 5 is therefore subjected to no bearing friction worth mentioning during running operation, and a correspondingly small proportion of its kinetic energy is consumed in over-

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coming this minor amount of friction, the greater proportion being utilized in rotating the running wheels 1 or 2 and consequently in driving the vehicle.

What I claim is:

1. A toy vehicle of the flywheel propelled type comprising a vehicle body, a traction wheel supported by said body at the forward end thereof, a plurality of resiliently mounted fingers secured to said body and extending rearward longitudinally of said body, first and second axles rotatably supported by different said fingers, a traction wheel supported by each of said first and second axles, said fingers yielding in a direction substantially normal to their longitudinal axis upon independent vertical movement of said traction wheels supported by said first and second axles, a third axle rotatably resting on the outer periphery of said traction wheels supported by said first and second axles, means comprising slots provided in said body and forming journals for said third axle, said slots being elongated in a vertical direction to provide for vertical movement of said third axle, said third axle normally journalling in the lower portion of said slots and a flywheel mounted on said third axle and extending into the space between the traction wheels on said first and second axles causing said third axle to bear against the top of the traction wheels mounted on said first and second axles, said fingers supporting said traction wheels mounted on said first and second axles being yieldable in response to downward pressure on said body to cause said third axle to bear against the top of said slots during energy storing actuation of said flywheel and thereafter to return it to normal position for running operation.

2. A toy vehicle of the flywheel propelled type comprising a vehicle body, a traction wheel supported by said body at the forward end thereof,

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a plurality of resiliently mounted fingers secured to said body and extending rearward longitudinally of said body, first and second axles axially mounted and each rotatably supported at one end by said body and at the other end by a different finger, a traction wheel supported by each of said first and second axles, said fingers yielding in a direction substantially normal to the longitudinal axis of said body upon independent vertical movement of said traction wheels supported by said first and second axles, a third axle rotatably resting on the outer periphery of said traction wheels supported by said first and second axles, means comprising slots provided in said body and forming journals for said third axle, said slots being elongated in a vertical direction to provide for vertical movement of said third axle, said third axle normally journalling in the lower portion of said slots and a flywheel mounted on said third axle and extending into the space between said traction wheels on said first and second axles causing said third axle to bear against the top of the traction wheels mounted on said first and second axles, said fingers supporting said traction wheels mounted on said first and second axles being yieldable in response to downward pressure on said body to cause said third axle to bear against the top of said slots during energy storing actuation of said flywheel and thereafter to return it to normal position for running operation.

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