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C. F. COOKSON
MECHANISM FOR AUTOMATICALLY CAUSING CHANGE
IN DIRECTION OF COURSE OF TRAVEL OF TOYS
Filed April 27, 1936

2,057,557

2 Sheets-Sheet 1

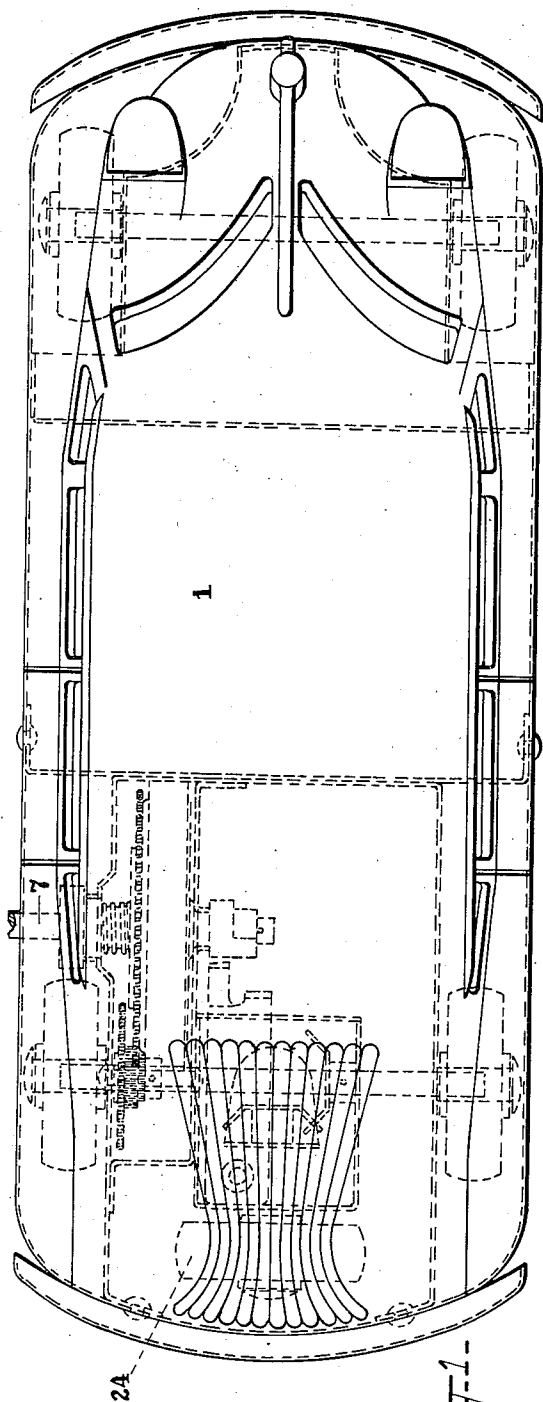


FIG. 1-

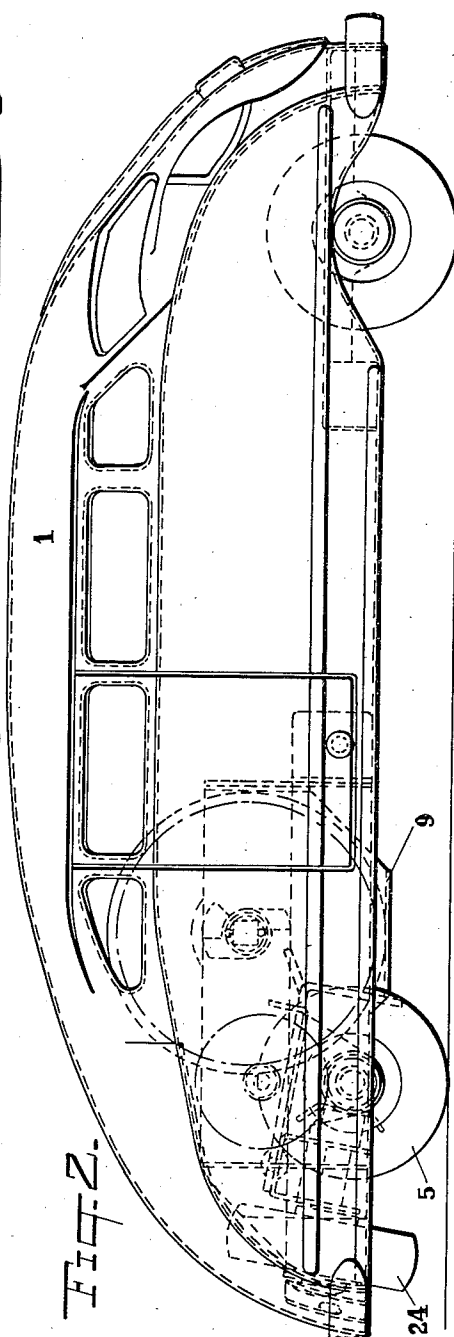


FIG. 2-

INVENTOR.

C. F. COOKSON.

BY

Merrill M. Blackburn
ATTORNEY.

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2 Sheets-Sheet 2

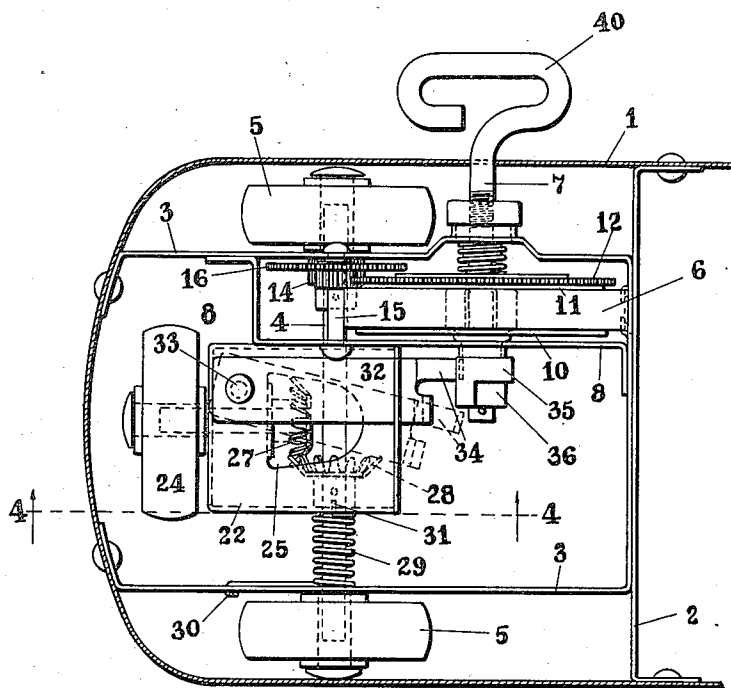


Fig. 3.

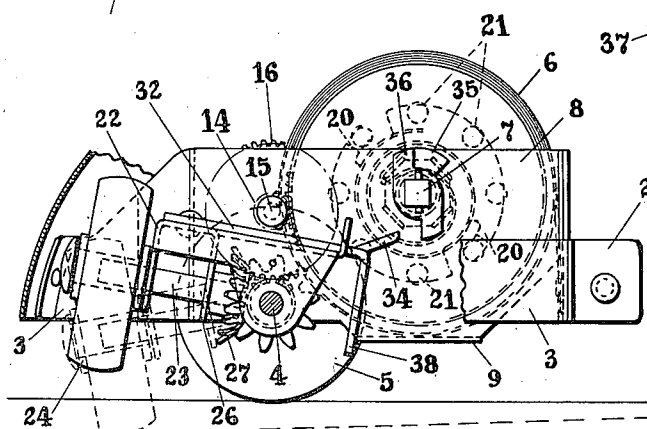


Fig. 4.

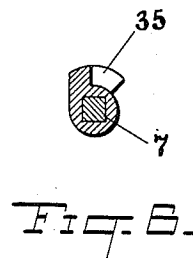


Fig. 5.

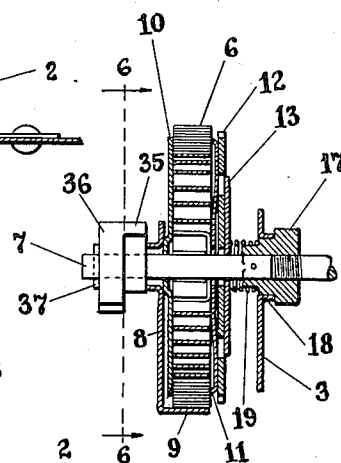


Fig. 5.

INVENTOR.

C. F. COOKSON.

BY

Merrill M. Blackburn
ATTORNEY.

UNITED STATES PATENT OFFICE

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MECHANISM FOR AUTOMATICALLY CAUSING CHANGE IN DIRECTION OF COURSE OF TRAVEL OF TOYS

Clarence F. Cookson, Shelton, Conn.

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9 Claims. (Cl. 46—213)

The present invention relates to toys and more particularly to mechanism for causing changes in the direction of travel thereof without the intervention of any human agency.

Among the objects of this invention are to produce a novel effect in the operation of a self-propulsive toy; to provide a toy which will, at a certain point of its operation, discontinue travelling in one direction and start off in another direction; to provide a toy of the nature indicated which is automatic in its operation; and such further objects, advantages, and capabilities as will hereafter appear and as are inherent in the construction disclosed herein. My invention further resides in the combination, construction, and arrangement of parts illustrated in the accompanying drawings and, while I have shown therein what is now considered the preferred embodiment of this invention, I desire the same to be understood as illustrative only and not to be interpreted in a limiting sense.

In the drawings annexed hereto and forming a part hereof,

Fig. 1 represents a plan view of a toy motor vehicle showing the general location of the operating mechanism of the vehicle;

Fig. 2 represents a side view further illustrating the location of this operating mechanism;

Fig. 3 represents a fragmentary horizontal section of the rear portion of the toy vehicle, showing more in detail the operating mechanism therefor;

Fig. 4 represents a vertical, longitudinal section taken approximately along the plane indicated by the broken line 4—4, Fig. 3;

Fig. 5 represents a vertical, transverse section taken approximately along the plane of the axis of the winding shaft; and

Fig. 6 represents a vertical section taken through the cam mechanism approximately along the plane indicated by the line 6—6, Fig. 5.

Reference will now be made in greater detail to the annexed drawings for a more complete disclosure of this invention. The motor vehicle body, as a whole, is designated by the numeral 1. This has a cross member 2 extending across the middle portion thereof and to this cross member is connected a frame 3, this frame being connected also to the rear portion of the vehicle body. This frame serves to support the rear end of the vehicle upon the axle 4. Upon the end of this axle and connected thereto in driving rela-

tion are the wheels 5 which serve to propel the vehicle as the motive means thereof runs down. This motive means comprises the spring 6 mounted on the winding shaft 7 which is mounted on the frame 3 and the angle-shaped support 8. This support 8 has a part 9 extending horizontally underneath the spring to prevent the same from sagging when it unwinds.

One end of the spring 6 is secured to the cross member 2, as shown most clearly in Figs. 3 and 4. A disc 10 is mounted on the shaft 7 between the angle-shaped member 8 and the spring 6 and serves as an abutment for one side of the spring to hold the same in place. Upon the opposite side of the spring is a distorted spring plate 11 which presses against the spring and against the disc 12 which is provided around its periphery with gear teeth. The opening through the center of the gear 12 is large enough so that the part of the shaft 7 which passes therethrough and which is square in cross section may turn freely with relation to the gear. A disc 13 having a square opening therein to fit the shaft 7 is provided with spring fingers 20 to engage the openings in the gear 12 so as to connect the two in driving relation and serve as a ratchet when the spring motor is being wound up. The teeth of the gear 12 mesh with the teeth of the gear 14 on the shaft 15, mounted in the frame 3 and the angle member 8. A gear 16, also mounted on the shaft 15 and rigidly connected therewith, has driving engagement with a corresponding gear on the axle 4, thus serving to transmit power from the spring 6 through the shaft 7, plate 13, gears 12, 14, 16, and the gear on the axle 4, whereby to drive the vehicle forwardly.

A bearing member 17 is pinned to the shaft 7 and extends through an opening in the frame 3, which opening is provided with a flange 18. A spring 19 surrounds the small inner end of the bushing 17 and bears at one end against a shoulder of this bushing and at its opposite end against the plate 13. Therefore, the gear 12 and plate 13 are held resiliently between the two springs 11 and 19, thus insuring that the fingers 20 of the plate 13 will engage the holes 21 of the gear 12 and maintain the two in driving relation.

A support 22 is mounted on the axle 4 in a manner so that it may oscillate about this axle during operation of the toy. A shaft 23 is mounted in the support 22 for rotation therein and carries at its rear end a wheel 24 which is intermittently brought down to engage the support upon which the toy is running. A hole 25 is formed in the support 22 and the metal thereof is bent down-

wardly to form a bracket 26 through which the shaft 23 passes and in which it rotates. Upon the inner end of the shaft 23 is mounted a bevel gear 27 which meshes with a corresponding gear 28 upon the axle 4. It will thus be seen that when the axle is driven it will cause driving of the gears 27 and 28 and the shaft 23 which causes rotation of the wheel 24. In order to hold the support 22 up so as to hold the wheel out of engagement with the surface which it intermittently engages, a coiled spring 29 surrounds the axle 4 and has one end engaged with the frame 3, as shown at 30. The other end 31 of the spring extends into an opening in the side of the support 22 and, therefore, when the spring is under tension, its tendency is to raise the wheel 24.

A lever 32 is pivoted at 33 upon the support 22 and may be swung sidewise more or less, being shown in its extreme positions in Fig. 3 by the solid and the dotted lines. This lever 32 is provided with a finger 34 engageable by actuating members 35 and 36 which are provided with square holes to engage the shaft 7. These are illustrated as being held in place on the shaft by means of a pin 37 passing therethrough, although they may fit the shaft tightly enough so that this pin is unnecessary. The lever 32 is provided with a finger piece 38 by means of which it may be swung laterally so that the finger 34 will be engaged by the arm or arms of one or the other of the actuating members 35 and 36 or else be out of position to be engaged by either of them, as indicated by the dotted lines in Fig. 3. The actuating member or members 35, 36 may be made unitary or independent, as desired.

When the key-handle 40, forming a part of shaft 7, is turned in the proper direction, it winds up the spring 6 and then the toy may be placed upon the floor or some other support and permitted to run. It then runs straight ahead for a distance which is dependent upon the position of the actuating member 35 or 36 and the position of the lever 32. We will assume that the parts are in the positions shown in Figs. 3 and 4. The toy will then run straight ahead for a short distance until the arm 36 raises the finger 34 to cause the wheel 24 to contact the floor, thereby causing the raising of the rear end of the vehicle. Now, since the wheel 24 is rotating transversely of the vehicle, it will cause the rear end thereof to swing around until the arm 36 releases the finger 34 so that the spring 29 may cause the wheel 24 to be lifted out of contact with the floor. When this happens, the wheels 5 again contact the floor and drive the vehicle straight ahead. On account of the small size of the arms of the actuating member 36, the wheel 24 is held down only long enough to cause the vehicle to turn through ninety degrees (90°) and, therefore, when lever 32 is swung over so that finger 34 is engaged by the actuating member 36, the vehicle will run in substantially a square. On the other hand, when the lever 32 is set in the position shown in Fig. 3, the vehicle will turn through one hundred eighty degrees (180°) and run back and forth practically on a straight line.

It is obvious from the foregoing that when the spring motor is wound up and the vehicle placed on the floor, the unwinding of the spring will cause turning of the axle 4 and the wheel 5. Since the gear 28 is mounted on the axle 4, this will also be caused to turn and, in turn, will cause turning of the gear 25 and wheel 24. Therefore, the wheel 24 is always turning when

the vehicle is advancing. The vehicle will be caused to change its direction of travel only when one of the actuating members 35 and 36 causes the wheel 24 to lift the rear end of the vehicle.

It is within the scope of this invention to build this toy with a single supporting wheel at one end and one or more wheels 24 to cause change in direction of travel of the toy.

It will of course be understood that the specific description of structure set forth above may be departed from without departing from the spirit of this invention as set forth in this specification and the appended claims.

Having now described my invention, I claim:

1. A toy comprising a body having supporting wheels, propulsion means for moving the toy, a rollable supporting element to lift one end of the toy from its supporting wheels and move it sidewise so that the toy will be propelled in a different direction, and automatically actuated control means for intermittently moving said rollable element into and out of contact with the surface upon which the toy is supported.

2. A wheeled toy supported at both ends upon wheels, propulsion means for propelling the wheels at one end of the toy, another wheel at one end of the toy for lifting the wheels at that end of the toy from the support and carrying that end of the toy around so that the toy, when propelled, will move in a different direction, and connections between said other wheel and said propulsion means such that said other wheel will always be rotated simultaneously with the propulsion wheels.

3. A toy having supporting wheels adjacent both ends thereof, the wheels at one end serving as means for propelling the toy, motive means to actuate said propelling wheels, another wheel connected to the motive means to be rotated thereby, and actuating means connected with said other wheel and with said motive means for causing said other wheel to lift from the supporting surface the supporting wheels at that end of the toy at which said other wheel is located.

4. Actuating means for a wheeled toy comprising a motor, gearing for transmitting power from the motor to an axle of the toy, a supporting frame pivotally carried by the axle, another axle carried and supported by said supporting frame, a wheel carried by said other axle, said wheel being carried by pivotal motion of said frame into and out of engagement with the surface upon which the toy is supported and serving to lift one end of the toy out of engagement with the surface upon which the toy is supported, said wheel being rotated by the first mentioned axle when the latter is driven by the motor and functioning, when it has lifted the end of the toy, to move said end laterally so as to cause a change in the direction of travel of the toy.

5. In a wheeled toy having a body and supporting wheels upon which the toy may travel and by which it may be propelled, the combination of an axle connecting part of the wheels to the body, a motor for actuation of the axle to cause propulsion of the toy, a continuously operating, intermittently functioning axle connected to the first named axle and carrying a wheel into and out of operative position, intermittently, and operating mechanism connected with the motor for intermittently causing the last mentioned wheel to engage the support for the toy so that said last mentioned wheel may function intermittently to make the first named wheels inoperative to drive the toy whereby to change the position of the toy.

6. In a wheeled toy having a body and supporting wheels upon which the toy may travel and by which it may be propelled, the combination of a motor having a rotatable shaft, gearing driven by said motor, an axle upon which part of said wheels are mounted and by which an end of the body may be connected to the last mentioned wheels, another wheel connected to said axle to be rotated thereby in a direction at a substantial angle to the direction of rotation of the first mentioned wheels, and actuating means connected to and operated by said shaft to cause said other wheel to intermittently raise the propelling wheels from the supporting surface for the toy whereby to enable said other wheel to cause side-wise movement of said end of the toy.

7. In a wheeled toy having a body and supporting wheels upon which the toy may travel and by which it may be propelled, the combination of a motor having a rotatable shaft, gearing driven by said motor, an axle upon which part of said wheels are mounted and by which an end of the body may be connected to the last mentioned wheels, another wheel connected to said axle to be rotated thereby in a direction at a substantial angle to the direction of rotation of the first mentioned wheels, and a cam carried by said shaft and intermittently actuating said other wheel into engagement with the surface on which the toy is supported and causing raising of that end of the toy by which said other wheel is carried so that said other wheel may cause lateral movement of said end.

8. A wheeled toy comprising a body supported on wheels for translation on the wheels in a longitudinal direction, another wheel adjacent one end of the toy arranged for rotation transversely of the direction of rotation of the first mentioned wheels, a motor for rotating said other wheel and

part of the supporting wheels, a shaft driven by said motor, an arm on said shaft, carrying means for said other wheel, said arm engaging said carrying means to force said other wheel into contact with the surface on which the toy is supported and lift that end of the toy from the supporting surface, said other wheel then causing that end of the toy to be moved laterally to change the direction of travel of the toy.

9. In a wheeled toy, front and rear axles for supporting the toy body, wheels on the axles for supporting and propelling the toy, a supporting framework pivotally mounted on the rear axle, a stub axle carried by said framework and having driving connection with the rear axle to be driven thereby, a wheel carried by said stub axle and rotating in a direction substantially at a right angle to the direction of rotation of the propelling wheels, a spring motor having a winding shaft, driving connections between the rear axle, the shaft, and the spring of the motor such that the spring can cause rotation of the shaft, the stub axle, and the rear axle, an actuating member carried by and rotating with said shaft, a finger on said framework projecting into proximity to the actuating member to be engaged and actuated thereby so that said framework and stub axle will be caused to turn with relation to said rear axle whereby to carry said wheel mounted on the stub axle into contact with the surface upon which the toy is supported, the movement of said actuating member, said framework, and said wheel causing the propelling wheels of the toy to be lifted out of driving contact with the supporting surface for the toy, and the movement of said wheel causing an end of the toy to be carried sidewise to cause change in direction of travel of the toy.

CLARENCE F. COOKSON.