

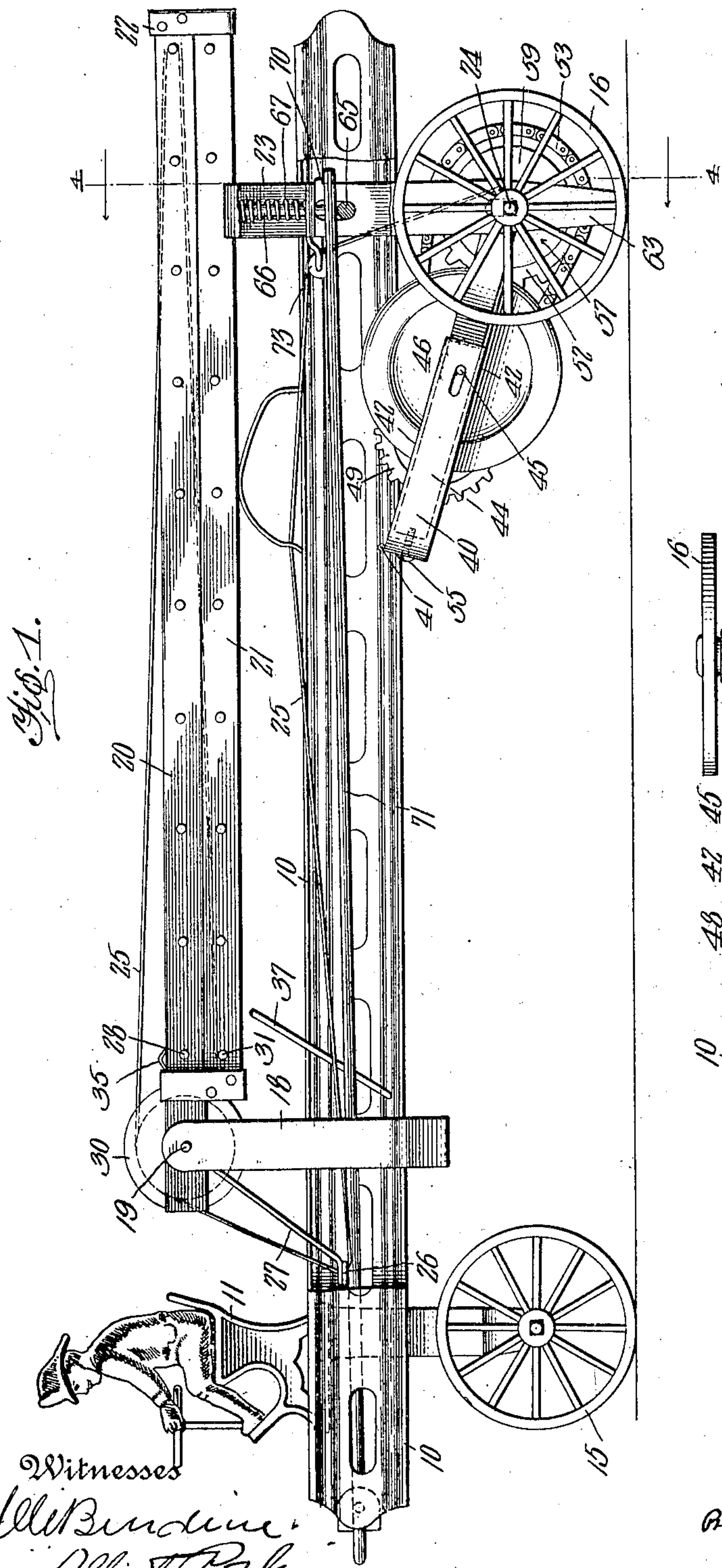
No. 844,877.

PATENTED FEB. 19, 1907.

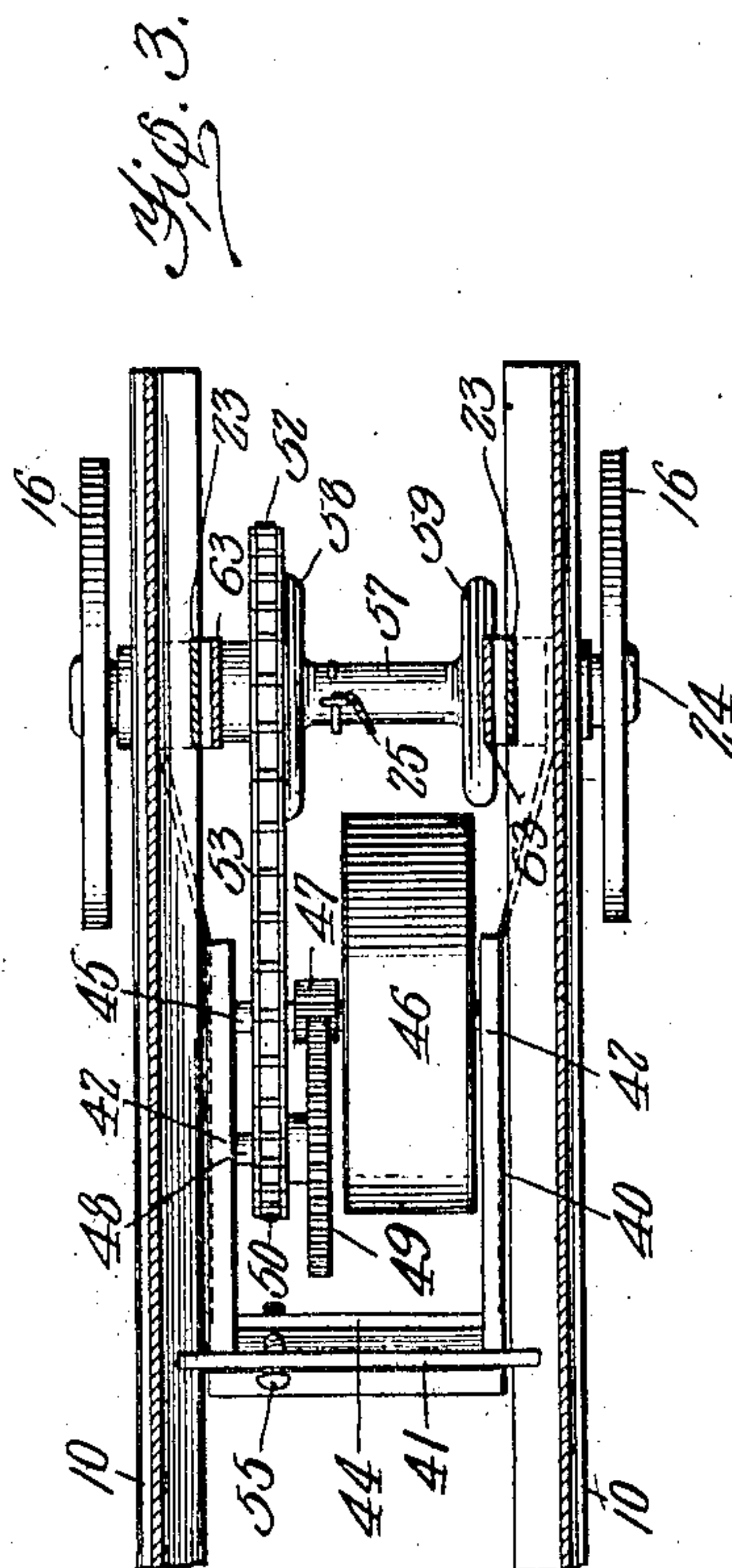
H. T. KINGSBURY.
TOY LADDER TRUCK.

APPLICATION FILED JUNE 9, 1908.

2 SHEETS—SHEET 1.



Witnesses
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UNITED STATES PATENT OFFICE.

HARRY T. KINGSBURY, OF KEENE, NEW HAMPSHIRE.

TOY LADDER-TRUCK.

No. 844,877.

Specification of Letters Patent.

Patented Feb. 19, 1907.

Application filed June 9, 1906. Serial No. 320,968.

To all whom it may concern:

Be it known that I, HARRY T. KINGSBURY, a citizen of the United States, residing at Keene, in the county of Cheshire, State of New Hampshire, have invented certain new and useful Improvements in Toy Ladder-Trucks, of which the following is a description, reference being had to the accompanying drawings and to the letters and figures of reference marked thereon.

This invention relates to wheeled toys of that class in which propelling-motors are employed, and especially those in which an inertia-wheel is used. In this class of toys there is unnecessary wear on the motor and wheel-tires and danger of injury to articles of furniture with which the toy may come into contact, owing to the fact that the inertia-wheel continues in motion until its energy is expended and the running wheels are turned even after the movement of the toy is arrested.

The principal object of the invention is to avoid and overcome these disadvantages by providing means for allowing the motor-wheel to run down idly and harmlessly whenever the movement of the toy is arrested by engagement with an obstacle.

A further object of the invention is to provide an inertia-wheel-propelled toy in which the rear or driving wheels are raised from the floor or other surface when the toy strikes against and is stopped by an obstacle.

With these and other objects in view the invention consists in the combination and arrangement of parts shown in the accompanying drawings and referred to in the appended claims.

In the accompanying drawings, Figure 1 is a sectional elevation of one form of wheeled toy having propelling mechanism constructed and arranged in accordance with the invention. Fig. 2 is a similar view of the front end of the same, showing the ladder which the toy carries moved to elevated position. Fig. 3 is a plan view of the motor. Fig. 4 is a transverse section of the toy on line 4 4 of Fig. 2, showing the motor mechanism in operative position. Fig. 5 is a similar view showing the position assumed after the toy has struck an obstacle, and Fig. 6 is a sectional view of a modification of the clutch mechanism.

Similar numerals of reference indicate corresponding parts throughout the specification and drawings.

While the present invention is applicable to all wheeled toys in which an inertia-motor is employed for propelling purposes, the illustration has been confined to a toy of that class known as "aerial-ladder trucks," in which a ladder pivoted to the truck is automatically raised when the truck strikes against an obstacle.

The device is constructed principally or wholly of metal and includes a body formed of a pair of connected sills 10, carrying at the front end a seat 11 for the driver or chauffeur. The body is supported by a pair of running wheels 15 at the front and a second pair of wheels 16 at the rear.

Between the sills is arranged a U-shaped frame 18, the vertical arms of which are provided with openings for the reception of a pin 19, the ends of the pin being preferably upset in order to hold it in place. On this pin is pivoted the lower ladder 20, which may be formed of any suitable material. The upper ladder-section 21 is slidably mounted on the lower section by means of pairs of clips 22, each clip being secured to one ladder-section and slidably embracing a portion of the other section. When lowered, the upper section of the ladder rests on a suitable support, which in this instance is in the form of an inverted-U-shaped frame 23, riveted to the sills 10 and having its side arms downwardly extended and provided with openings for the passage of the rear driving-axle 24 of the truck.

The ladder is elevated through suitable mechanism, the power being transmitted in the present instance by means of a cord or chain 25, which first passes through an eye 26, formed at the apex of an approximately-V-shaped spring 27, the two arms of which have eyes for the passage of the pin 19 and at their extreme ends are connected to one of the rungs 28 of the lower ladder-section. The cord thence passes around a guiding-sheave 30 on pin 19, thence over the top rung of the lower ladder-section, and is connected at the end to the lower rung 31 of the upper ladder-section.

When the cord 25 is pulled rearward, it acts first on the spring 27, pulling the latter downward and rearward and moving both

ladder-sections to approximately vertical position. During this movement the upper section of the ladder is held from sliding by a small friction-spring 35, which is carried by the lower section and engages under one of the slidable clips 22, carried by the upper section, the frictional resistance of the spring being sufficient to prevent sliding movement until both sections are in the erect position. The spring 27 further serves to form a yieldable stop by engaging a loop 37, carried by the sills, and prevents the ladder being thrown too far forward.

Pivotally mounted on the axle 24 are the rear ends of the arms of a U-shaped frame 40, the front end of which is supported by the sills 10, preferably by a cross-bar 41, secured to the frame and resting on the lower flanges of said sills. The two arms of the frame 40 are provided with edge flanges 42 for the greater portion of their lengths, and these flanged arms form guides and supports for a slidably-mounted U-shaped frame 44, which has bearing-openings for a shaft 45, on which is secured a heavy inertia-wheel 46 and a pinion 47. The frame 44 also carries a stud 48, on which is mounted a gear-wheel 49, intermeshing with the pinion 45. The stud also supports a sprocket-wheel 50, which is secured to or formed integral with the gear-wheel.

Mounted on and rigidly secured to the axle 24 is a sprocket-wheel 52, which is connected to the sprocket-wheel 50 by means of a link belt 53. As there is some tendency to slackening of the belt through wear and stretching, the frame 44 is provided with a threaded opening for the reception of a screw 55, which passes through an unthreaded opening in the frame 40, so that the frame 44 may be adjusted and the belt kept as taut as desired.

Mounted loosely on the axle 24 is a winding spool or drum 57, having end flanges 58 and 59, the flange 58 being slightly recessed to form a friction-disk for engagement with a mating friction-clutch member 60, formed on one side of the sprocket-wheel 52. The outer face of the other flange 59 has a rounded cam-shaped hub 61, which may be engaged by a spring-arm 62, which is secured to one arm of a vertically-movable clutch-operating frame 63 and is provided with a vertically-elongated opening for the passage to the axle 24.

The frame 63 is in the form of an inverted U, and its arms are provided with vertically-elongated openings for the passage of the axle 24 and also for the passage of a rigid bar 65, that extends between the two sills 10. Extending vertically between the bar 65 and the horizontal bar of the ladder-rest 23 is a bar 66, around which is arranged a helical compression-spring 67, that tends to move the clutch-operating frame 63 downward to operative position, and when moved down to its fullest extent the lower ends of the frame

will strike against the floor or other supporting-surface and raise the rear wheels clear of the floor.

The vertical arms of the frame 63 are provided with shoulders 70, which may be engaged by the inbent ends of the arms of a U-shaped bumper 71, the cross-bar of which projects in front of the truck in position to engage a wall, an article of furniture, or other obstacle, or which may be operated by hand, and when pushed back the frame 63 is released and is immediately pushed down by the spring 67.

The rear end of the cord 25 passes over a small guiding-roller 73, carried between the sills 10, and is secured to the winding-drum 57.

In operation, the ladder being lowered and frame 63 locked in elevated position by the bumper, the inertia-wheel is started into motion by hand or by rolling the toy quickly over a surface, and when sufficient momentum has been acquired the truck is allowed to run over the floor until the bumper strikes an obstacle, the inertia-wheel serving as the propelling means. During this movement the spring 62 is free from the winding-drum, and the latter will not be rotated. As soon, however, as the frame 63 is released and is moved down by spring 67 the arm 62 acts on the cam-like hub 61 of the winding-drum, and the latter is forced against the friction-clutch member 60, so that the drum will be rotated and in rotating will wind up the cord or chain 25 and raise the ladder. During the ladder-raising operation the inertia-wheel will not be retarded by the rear wheels remaining in contact with the floor, inasmuch as the arms of frame 63 pass below the wheels and elevate the rear end of the entire device, the wheels spinning around loosely, so that their tires will not be injured and there will be no unnecessary strain or wear on the motor or damage to articles of furniture with which the toy may come into contact.

The parts may be restored to initial position by raising the frame 63 to allow the ends of the bumper to again lock it, after which the ladder may be pushed down to the lowered position.

In some cases the connecting-cord may be replaced by other forms of transmission devices—such as gears and racks, sprocket-wheels and belts, and the like—and the clutching mechanism may also be modified, as shown, for instance, in Fig. 6, wherein the shaft 24 carries a fixed clutch-sleeve 80 and the sprocket-wheel 52' is loose on the shaft and carries a friction-clutch member 60' to engage the winding-drum and a clutch member 81 for engagement with the clutch-sleeve 80. In this instance the clutches 80 and 81 will remain in contact to propel the toy until the bumper strikes an obstacle, and then the sleeve 81 will be shifted to release the shaft and engage the winding-drum, so

that the running wheels will not continue to turn after the toy stops.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A wheeled toy, a motor therefor, and means for permitting idle operation of the motor and driving-wheels when the movement of the toy is arrested.
2. A wheeled toy, a motor therefor, and means for nullifying the propelling force of the driving-wheels without stopping their rotative movement when the movement of the toy is arrested.
3. A motor-driven wheeled toy, including a permanently-connected motor and driving-wheels, and an obstacle-actuated means for nullifying the driving action of the motor and wheels.
4. A motor-driven wheeled toy having a driving-wheel, and means for raising the driven wheel from the surface when the toy strikes an obstacle.
5. A wheeled frame, a motor, a driving-wheel connected to the motor, and means for raising the driven wheel from the ground when the wheeled frame strikes an obstacle.
6. A wheeled frame, an inertia-wheel for propelling the same, and means automatically operable on abrupt stopping of the frame for insuring idle movement of the inertia-wheel.

7. A wheeled toy, an inertia-wheel for propelling the same, and an obstacle-controlled elevating device for raising the wheels of the frame from the supporting-surface.

8. A frame having driving-wheels, an inertia-motor for operating the driving-wheel, and an obstacle-actuated elevating means for raising the driving-wheels from the supporting-surface.

9. An inertia-wheel-propelled toy, an inverted-U-shaped frame carried thereby, a spring tending to move the frame downward and elevate the wheels from the supporting-surface, and a bumper normally holding said frame in elevated position.

10. A wheeled frame, a ladder carried thereby, a motor for propelling the frame, and an obstacle-actuated means for nullifying the propelling operation, and connecting the motor to the ladder.

11. A wheeled frame, a ladder pivoted thereto, a motor for propelling the frame, and means for automatically nullifying the propelling action of the motor and connecting said motor to the ladder.

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

HARRY T. KINGSBURY.

Witnesses:

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L. G. LITCHFIELD.