

June 1, 1926.

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1,587,083

ELECTRICALLY DRIVEN TOY VEHICLE

Filed May 1, 1925

2 Sheets-Sheet 1

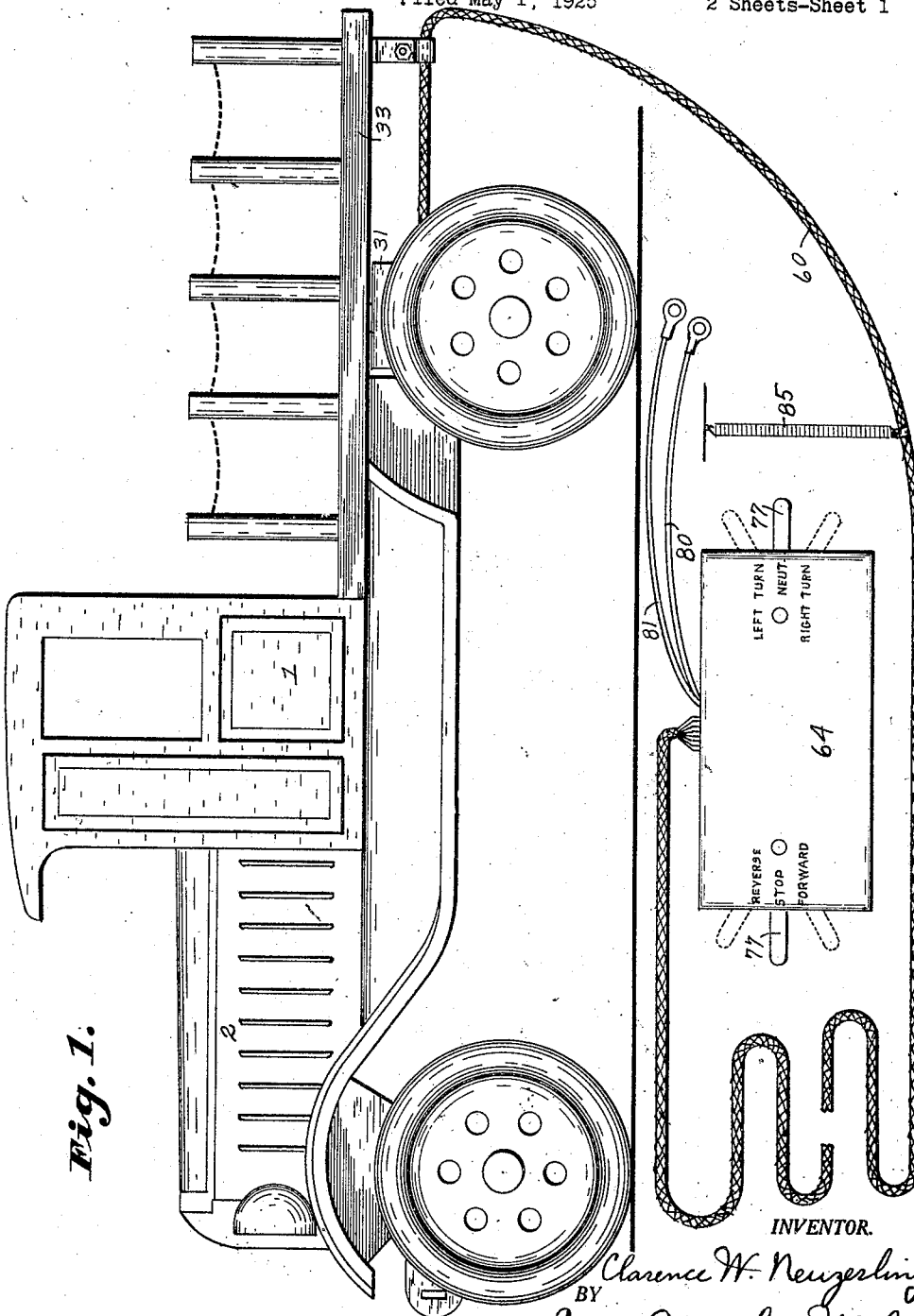


Fig. 1.

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Fig. 2.

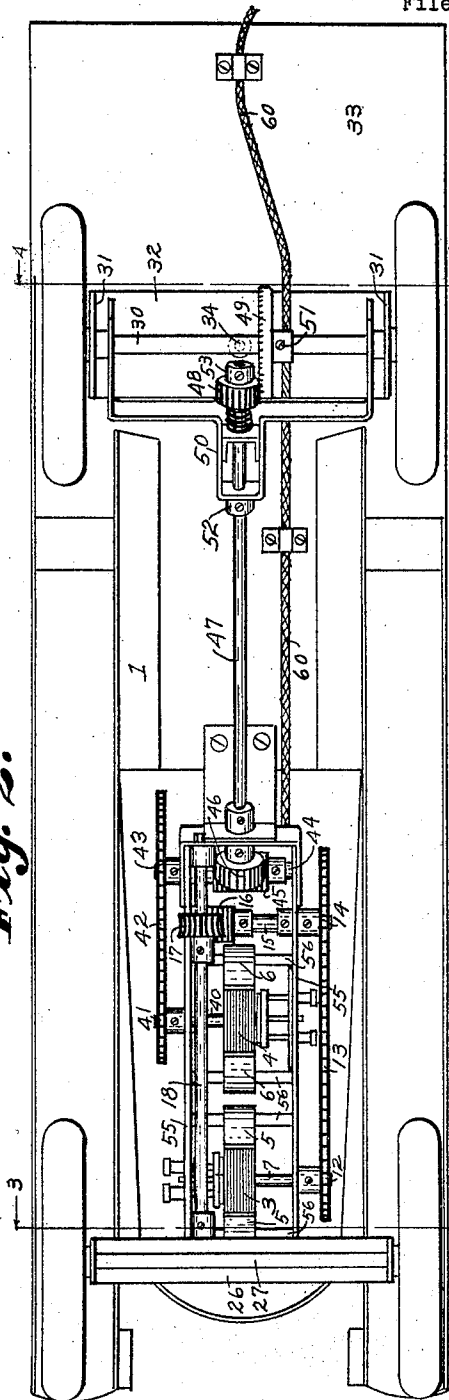


Fig. 3.

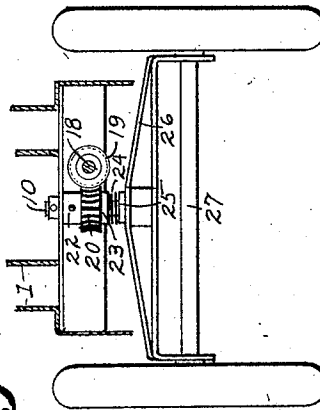


Fig. 4.

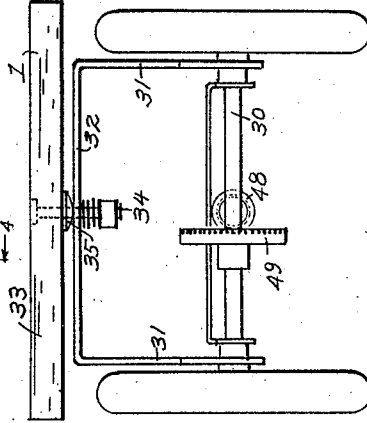


Fig. 5.



Fig. 6.

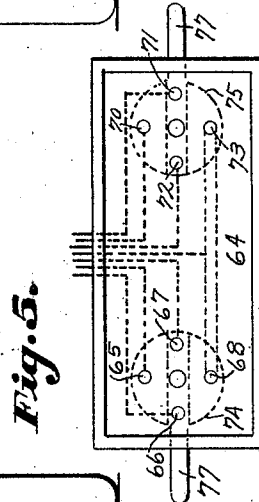
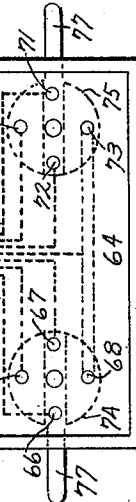


Fig. 7.



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UNITED STATES PATENT OFFICE.

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ELECTRICALLY-DRIVEN TOY VEHICLE.

Application filed May 1, 1925. Serial No. 27,333.

This invention relates to improvements in electrically driven toy vehicles.

Objects of the invention are to provide means whereby a person may direct the movements of the vehicle from a distant point to cause it to travel forwardly or backwardly and to steer it in various directions; also to provide simple means whereby the vehicle may be driven by a single wheel which will conform to uneven surfaces and maintain continuous traction upon the floor or other surface over which the vehicle is traveling.

A further object is to provide means whereby the steering mechanism may be operated by inexperienced persons without danger of overloading the motor when the steering axle reaches the limit of its turning movement.

A further object is to provide an electrically driven mechanical toy vehicle which may be operated about the floor of a room by a person seated at a switchboard, the latter being mounted upon a table, wall, or any other suitable support.

In the drawings:—

Figure 1 is a side elevation of a toy vehicle embodying my invention and showing also the switchboard and electrical connections.

Figure 2 is a view of the same as seen from the under side.

Figure 3 is a sectional view drawn on line 3—3 of Figure 2.

Figure 4 is a sectional view drawn on line 4—4 of Figure 2.

Figure 5 is a view of the switchboard as seen from the rear side.

Figure 6 is a view of one of the switch levers as seen from the rear side.

Figure 7 is a sectional view on line 7—7 of Figure 6.

Like parts are identified by the same reference characters throughout the several views.

The body 1 of the vehicle has the usual form of a motor driven vehicle, the construction shown illustrating a truck. Underneath the hood 2 there are two electric motors, the armatures of which are indicated at 3 and 4 in Figure 2. The field magnets are indicated at 5 and 6. The forward motor shaft 7 is operatively connected with a steering post 10 by the sprocket wheel 12, chain 13, sprocket wheel 14, transverse shaft 15, worm 16, worm wheel 17, shaft 18,

worm 19, and worm wheel 20, the latter being mounted upon the steering post 10. The wheel 20 is not positively connected with the steering post but bears frictionally upon a disk 22 against which the wheel is pressed by the spring actuated disk 23, there being a coiled spring 24 interposed between this disk and a bearing plate 25 carried by the bolster 26, the steering post serving as a means for turning the steering wheels and also as a king pin. The ends of the bolster 26 are down turned and apertured to receive the axle 27, whereby the turning movement of the bolster is transmitted to the front axle and the associated wheels. The disk 22 is fast on steering post 10.

It will be understood that the object of frictionally connecting the forward motor with the central steering post through the friction disk 22 is to allow the motor to continue to turn without over-load after the steering wheels have been turned to the limit of their movement in either direction. If desired, the same slip joint connection may be made between the driving connection of the rear motor and the rear axle. The frictional connection may be made at any convenient point in the line of motion transmission.

The rear axle 30 is similarly supported in the down turned end portions 31 of the rear bolster 32. The latter is connected with the under side of the platform 33 by a bolt 34 having an interposed apertured stud or bearing 35, whereby the bolster is permitted to oscillate to an extent determined by the space between the respective ends of the bolster and the platform.

The rear motor shaft 40 is operatively connected to turn the rear axle and drive one or both rear wheels through the sprocket wheel 41, chain 42, sprocket wheel 43, shaft 44, worm 45, worm wheel 46, transmission shaft 47 and gear wheels 48 and 49, the latter being secured to the rear axle 30 by a set screw 51 passing through its hub. The rear end of the transmission shaft 47 is supported by bracket 50 from the rear axle, said bracket being formed to provide two bearings and the transmission shaft having adjustable collars 52 and 53 which limit longitudinal movements of the shaft.

The motor shaft and also the forward end of the transmission shaft 47 are journaled in a sub-frame 55 and the field pieces

of the respective motors are supported from this same frame by cross rods or bars 56.

The electrical wires or connections for the respective motors are bundled in a cord 60 and lead to the respective motors from suitable groups of terminals mounted upon a switchboard 64. When the pairs of terminals 65 and 66, 67 and 68 are bridged, an electrical circuit may be closed through the forward motor by means of a switch lever, hereinafter described, to drive said motor in a direction to turn the steering wheels to the right. When the terminal 65 is bridged to 67 and terminal 66 to terminal 68, the direction of the current is reversed and the motor will be operated to turn the steering wheels to the left.

Referring now to the group of terminals at the other end of the switchboard, a bridging of terminals 70 to 71 and 72 to 73 will operate the rear motor in a direction to cause the vehicle to move forwardly, whereas by bridging of terminal 70 to 72 and 71 to 73, the current will be reversed and the motor will be operated to back the vehicle.

The switch levers 74 and 75 for the respective groups of contact terminals are located at opposite ends of the switchboard 64. Each lever comprises an insulated handle 77 and a pair of contacts 78 and 79 respectively, these contacts being suitably formed for bridging the terminals in pairs, as above described, with an intermediate neutral position in which neither circuit will be closed but in which said contacts 78 and 79 will respectively register with only one terminal of each pair such, for example, as the terminals 71 and 72 or the terminals 66 and 67.

It will of course be understood that the switchboard is electrically connected with a suitable source of electric power through the leading-in wires 80 and 81.

The cords may of course be made of any desired length whereby the switchboard may be mounted at the most convenient point in a room. If desired, the cords may be supported at an intermediate point by any suitable means such, for example, as the light coiled spring 85 illustrated in Figure 1, as being connected to the ceiling of the room for the purpose of holding the cord above the floor, the spring, however, being adapted to yield with sufficient freedom to allow the vehicle to travel to all parts of the room.

I claim:—

1. The combination with a toy vehicle having steering and driving wheels, of a pair of electric motors mounted upon said vehicle, one of said motors being operatively connected to swing the steering wheel axle for steering purposes, and the other

motor being operatively connected with a driving wheel, and flexibly connected, relatively stationary, current controlling means adapted to be operated from a fixed point to control the movements of said vehicle and actuate it in any direction and to any distance within the range of movement permitted by said flexible connections.

2. The combination with a toy vehicle having steering and driving wheels, of a pair of electric motors mounted upon said vehicle, one of said motors being operatively connected to swing the steering wheel axle for steering purposes, and the other motor being operatively connected with a driving wheel, said steering wheel connections including a pair of frictionally yieldable driving and driven members adapted to allow the motor to continue in operation after adjusting the steering wheels to the limit of their movement in either direction.

3. The combination with a toy vehicle having steering and driving wheels, of a pair of electric motors mounted upon said vehicle, one of said motors being operatively connected to steer the vehicle and the other motor being operatively connected with a driving wheel, a relatively stationary switchboard provided with switches controlling the circuits of the respective motors, and flexible electrical connections between the switchboard and said motors, adapted to permit a limited range of vehicle travel in various directions relatively to the switchboard.

4. In a toy vehicle, the combination with steering wheels, of a steering post, an electric motor operatively connected to oscillate the steering post, and means for allowing the motor to continue in operation after oscillating the steering post to the limit of its movement in either direction.

5. In a toy vehicle, having electrically operable driving and steering mechanisms and also having flexible connection with a relatively stationary source of electric power, the combination with such flexible connection, of a relatively stationary switchboard in independent controlling relation to both the driving and steering mechanisms of the vehicle.

6. The combination with a switchboard adapted to be placed upon a support such as a table, of a toy vehicle provided with driving and steering mechanisms, separate motors for operating the driving and steering mechanisms respectively, separate switches on the switchboard, each controlling operation of one of the motors, and a flexible cord containing the conductors for the respective motors, extending from the switchboard to such motors.

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