

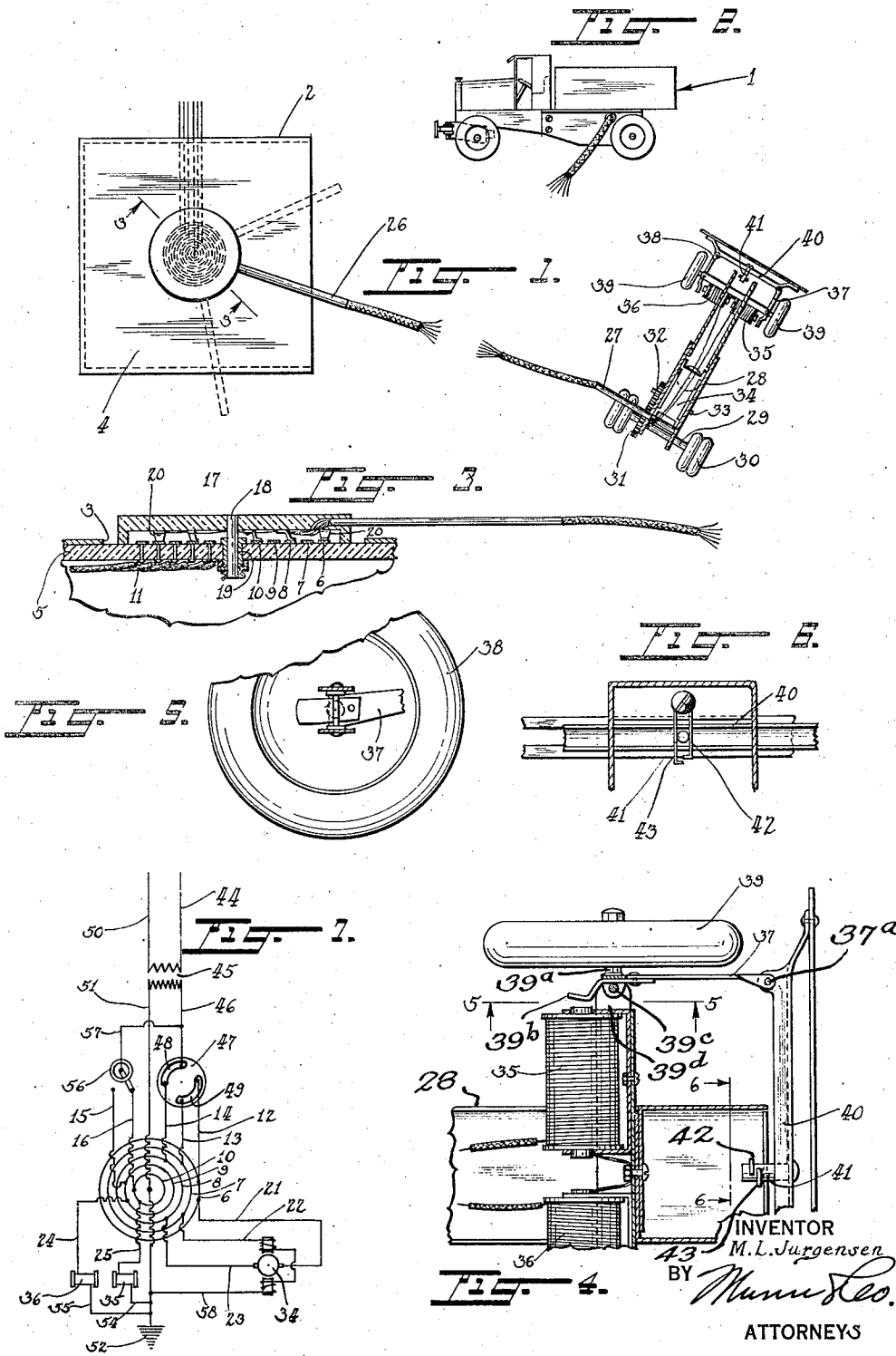
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ELECTRIC TOY

Filed April 18, 1929



UNITED STATES PATENT OFFICE

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ELECTRIC TOY

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My invention relates to improvements in electric toys, and it consists in the combinations, constructions, and arrangements herein described and claimed.

5 An object of my invention is to provide an electric toy which may be of any desired construction or formation, but for the purpose of illustration it is shown in the form of a truck, which is adapted to be op-
10 erated electrically by remote control.

A further object of my invention is to provide a device of the type described in which the truck has a novel means for normally holding the front wheels in the forward moving position.

15 A further object of my invention is to provide a device of the type described which has novel means for steering the truck to one side or to the other.

20 A further object of my invention is to provide a device of the type described which has novel means for retaining complete electrical connection with the truck irrespective of its position with the garage.

25 Other objects and advantages will appear in the following specification, and the novel features of the invention will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings forming part of this application, in which

Figure 1 is a top plan view of my device, a portion thereof being shown in section,

35 Figure 2 is a side elevation of the truck portion,

Figure 3 is a section along the line 3—3 of Figure 1,

40 Figure 4 is a fragmentary bottom plan view of my device, a portion thereof being shown in section,

Figure 5 is a section substantially along the line 5—5 of Figure 4,

45 Figure 6 is a section along the line 6—6 of Figure 4 shown in the upright position, and

Figure 7 is a wire diagram.

In carrying out my invention I provide a truck member 1 and a garage member 2. The garage member 2 is provided with an opening 3 in the top 4 thereof, adjacent to

which is disposed an insulating member 5. Conductor rings 6, 7, 8, 9, and 10 are mounted upon the insulating member 5 at spaced apart positions. A plurality of terminal posts 11 are electrically connected to the rings 6 to 10 inclusive. Conductors 12, 13, 14, 15, and 16 are electrically connected to the rings 6 to 10 inclusive through the terminal posts 11.

55 A pivotal contact member 17 is provided with a central shaft 18 which extends through a bearing 19 in the insulating member 5 and is arranged to pivot with respect thereto. Resilient contact members 20 are disposed at spaced apart positions upon the inner surface of the rotating member 17 and in frictional engagement with the rings 6 to 10 inclusive. Conductors 21, 22, 23, 24, and 25 are electrically connected to the rings 6 to 10, inclusive, through the resilient contact member 20.

70 The conductors 21 to 25 inclusive extend through a tubular member 26 and a tubular member 27, the latter being carried by the truck member 1. The truck member 1 is provided with a frame 28 which has a rear axle 29 rotatably carried thereby. Wheels 30 are mounted upon the axle 29 at the outer ends thereof. A driven gear 31 is rigidly mounted upon the axle shaft 29 and is in mesh with a drive gear 32. The drive gear 32 is rigidly mounted upon a motor shaft 33 which is carried by a motor 34. Electromagnets 35 and 36 are carried by the frame 28 and are disposed in close proximity to steering levers 37 and 38 respectively. Front wheels 39 are rotatably mounted on axles such as that shown at 39^a in Figure 4. Each axle is rigidly secured to a lever such as that shown at 37. Secured to the lever is an armature 39^b adjacent to one end of the electromagnets 35 and 36. The armature in turn is pivotally mounted at 39^c on a cross member 39^d carried by the frame 28. As will be seen from Figure 1, there are two levers 37 and 38, these levers being on opposite sides of the frame. Each lever is pivotally connected to a bumper or connecting member 40, the pivotal connection of the lever 37 being shown at 37^a in Figure 100

4. The connecting member 40 is provided with an inwardly extending lug or pin 41 which is normally held in alignment with the center line of the frame by means of resilient spring members 42 and 43 which are carried by the frame 28. When one of the solenoids is actuated, as for instance the solenoid 35, it will swing the armature 39^b inwardly thus turning the axle 39^a, and it will also cause a shifting of the member 40 against the action of the spring 42. The movement of the member 40 will cause a corresponding shifting of the axle of the opposite wheel 39 in the same direction and to the same extent thus turning both wheels simultaneously. The energizing of the opposite solenoid 36 will cause a corresponding movement in the opposite direction. When the solenoids are de-energized, the wheels are brought to their central position by means of the springs 42 or 43.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. It will be noted that the positive conductor 44 extends to a transformer 45. The positive conductor 46 extends from the transformer 45 to a switch 47 which has arced shaped contact plates 48 and 49 thereon. Conductors 12 and 13 are in electrical connection with the plate 49, as shown, and the conductor 14 is in electrical connection with the contact plate 48. The conductor 46, as shown, is in electrical connection with the contact plate 48. A negative conductor 50 extends to the transformer 45 and a negative conductor 51 extends from the transformer 45 to the shaft 18 and to a ground 52. The magnetic coils 35 and 36 are connected to the ground 52 through conductors 54 and 55 respectively. A steering switch 56 is arranged to electrically connect either of the conductors 13 or 16 with the positive conductor 46 through a conductor 57.

With the switch 47 in the position shown in Figure 7, a current will flow through the conductor 44, the primary of the transformer 45, the conductor 50 to the generator. The induced current will pass through the wire 46, the conductor plate 48, the conductor 14, the conductor ring 8, the conductor 23, through the armature of the motor 34, the conductor 21, the conductor ring 6, the conductor 12, through the conductor plate 49, the conductor 13, through the conductor ring 7, the conductor 22, through the field of the motor, and to the ground 52 through a conductor 58. This flow of the current will actuate the motor 34 and propel the truck member 1 forwardly through its operative connection with the axle shaft 29.

The truck member 1 may be propelled forwardly for the full length of the cable containing the conductors 21 to 25 inclusive, and the cable may be as long as desired. The

operator may steer the truck member in either direction, i. e.: to the right or to the left, if so desired. The front wheels 39 are normally held in parallel relation with the frame 28 by means of the spring members 42 and 43 when the switch 56 is out of registration with both conductors 15 and 16. When the switch 56 is actuated so as to close the circuit between the conductor 57 and the conductor 16, the current is allowed to pass from the positive conductor, through the switch 56, the conductor 16, the conductor plate 10, the magnetic coil 35, and to the ground 52 through the conductor 54. As the current passes through the magnetic coil 35 the steering lever 37 is actuated so as to turn the wheels 39 to the right. By actuating the switch 56 so as to move the switch out of engagement with the conductor 16 the circuit is broken, which includes the magnetic coil 35 thus releasing the steering lever 37 and allowing the spring member 42 to return the front wheels 39 to their normal positions.

By moving the switch 56 into registration with the conductor 15 the circuit is closed allowing the current to pass from the positive conductor, through the switch 56, the conductor 15, through the contact ring 9, the conductor 24, through the magnetic coil 36 and to the ground 52 through the conductor 55. As the current passes through the magnetic coil 36 the steering lever 38 is actuated thus steering the truck member 1 to the left. If so desired the truck member may continue its movement to the left indefinitely, circling around the garage member 2 and retaining the electrical connection due to the movable member 17 and the electrical connections with the rings 6 to 19 inclusive. Furthermore, the operator may control the truck member so that it may be moved into and out of the garage by the remote control, or moved to any position or through any path at any desired distance around the garage.

The truck member may also be moved in the reverse direction, i. e.: rearwardly, by actuating the reversible switch 47 so as to move the conductor plate 48 into registration with the conductors 13 and 14 and move the conductor plate 49 into registration with the conductors 12 and 46. In this manner the motor 34 is reversed thus moving the truck member 1 in the reverse direction.

I claim:

1. A device of the type described comprising a movable toy provided with wheels, electromagnetic means for turning certain of said wheels to steer the toy, and means for bringing the wheels into a normal position for causing a direct forward movement when the electromagnetic means is de-energized.

2. A device of the type described comprising a movable toy provided with wheels, electromagnetic means for turning certain of said wheels to steer the toy, and a spring car-

ried by the body portion of the toy and arranged to be placed under tension when the wheels are turned and adapted to restore the wheels to a normal position for direct forward movement of the body when the electromagnetic means is de-energized.

3. A device of the type described comprising a movable toy, wheels carried by said toy, an electromagnetic device associated with each wheel, means actuated by each of said electromagnetic devices for turning its individual wheel to effect the steering of the toy, and connections between both wheels for effecting a similar turning of the opposite wheel.

4. A device of the type described comprising a movable toy, wheels carried by said toy, an electromagnetic device associated with each wheel, means actuated by each of said electromagnetic devices for turning its individual wheel to effect the steering of the toy, connections between both wheels for effecting a similar turning of the opposite wheel, and spring means for returning both wheels to their normal position for effecting a direct forward movement of the toy.

5. In a device of the type described, an electrical toy comprising a frame, a pair of solenoids carried by said frame, a wheel associated with each solenoid and having an axle, means for pivotally mounting each axle, an armature rigidly secured to each of the axles, and means for energizing each of said solenoids at will.

6. In a device of the type described, an electrical toy comprising a frame, a pair of solenoids carried by said frame, a wheel associated with each solenoid and having an axle, means for pivotally mounting each axle, an armature rigidly secured to each of the axles, means for energizing each of said solenoids at will, a lever rigidly connected to each of said armatures, and a cross member pivotally connected to the levers, whereby the turning of one axle will effect a corresponding turning of the opposite axle.

7. In a device of the type described, an electrical toy comprising a frame, a pair of solenoids carried by said frame, a wheel associated with each solenoid and having an axle, means for pivotally mounting each axle, an armature rigidly secured to each of the axles, means for energizing each of said solenoids at will, a lever rigidly connected to each of said armatures, a cross member pivotally connected to the levers, whereby the turning of one axle will effect a corresponding turning of the opposite axle, a pin carried by said cross member, and springs carried by said frame for returning said cross member to a normal neutral position to bring the wheels into parallel relation when the solenoids are deenergized.

8. A device of the type described comprising an electrical vehicle consisting of a

frame, a pair of solenoids carried by the frame, means for energizing each of said solenoids at will, a wheel associated with each of said solenoids, an axle for each wheel, each of said axles being pivoted at one end, an armature connected with each of said axles, each of the armatures being in the field of its individual solenoid, a lever member rigidly connected to each of said armatures, a movable bumper member pivotally connected at its opposite end to said levers, a pin carried by said bumper member, a spring carried by said frame on each side of said bumper member for normally holding the bumper member in a central position, and electrically operated means for propelling the vehicle.

Signed at Chicago in the county of Cook and State of Illinois this 13th day of April, 1929.

MAX L. JURGENSEN.