

Nov. 15, 1955

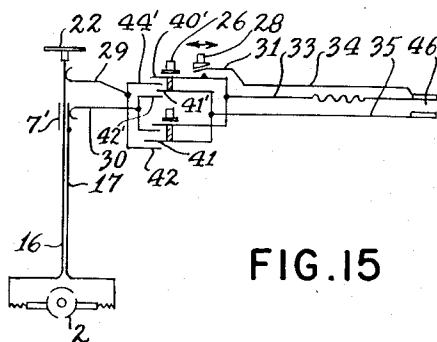
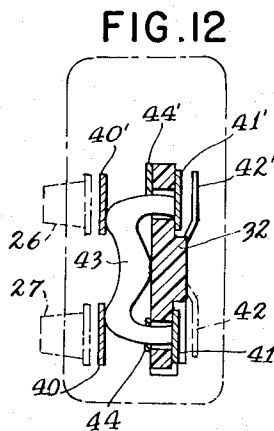
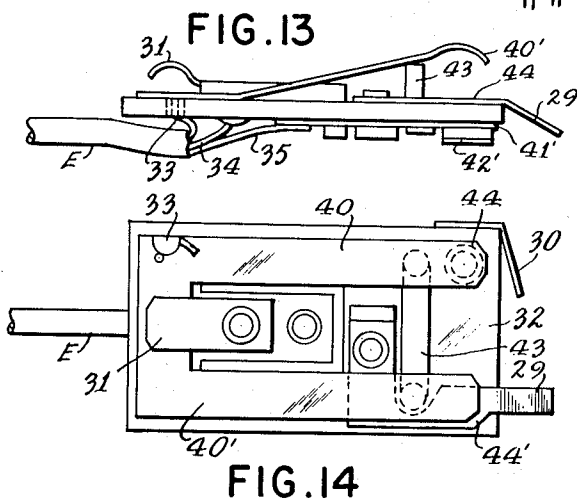
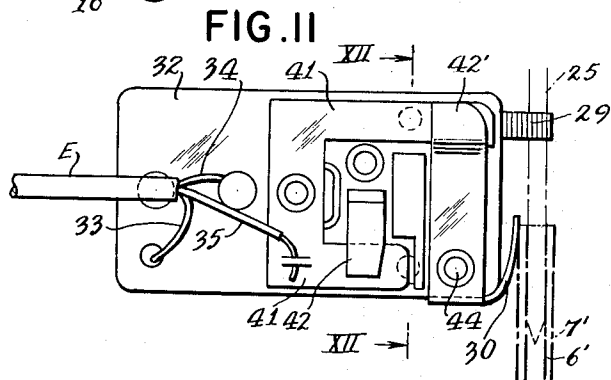
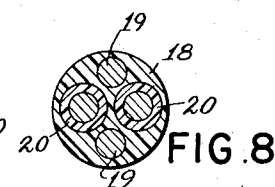
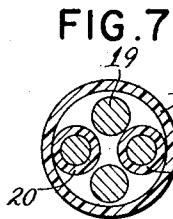
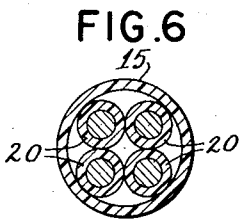
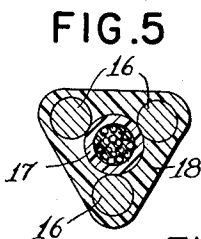
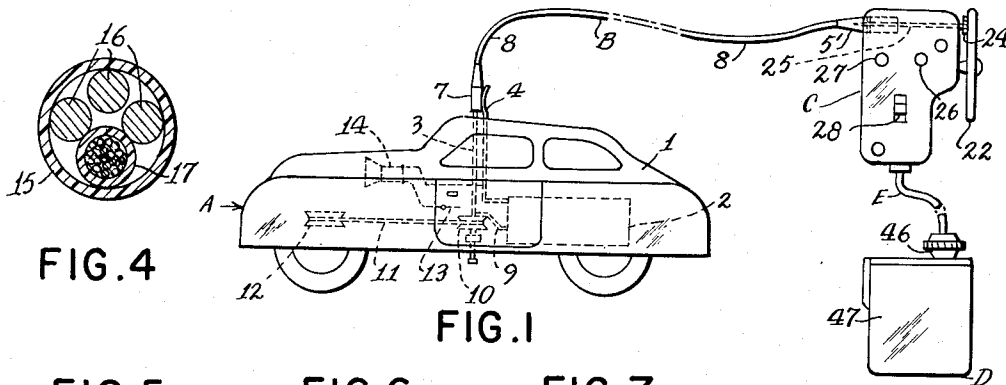
H. MÜLLER

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REMOTELY CONTROLLABLE ELECTRIC TOY

Filed Nov. 21, 1952

2 Sheets-Sheet 1



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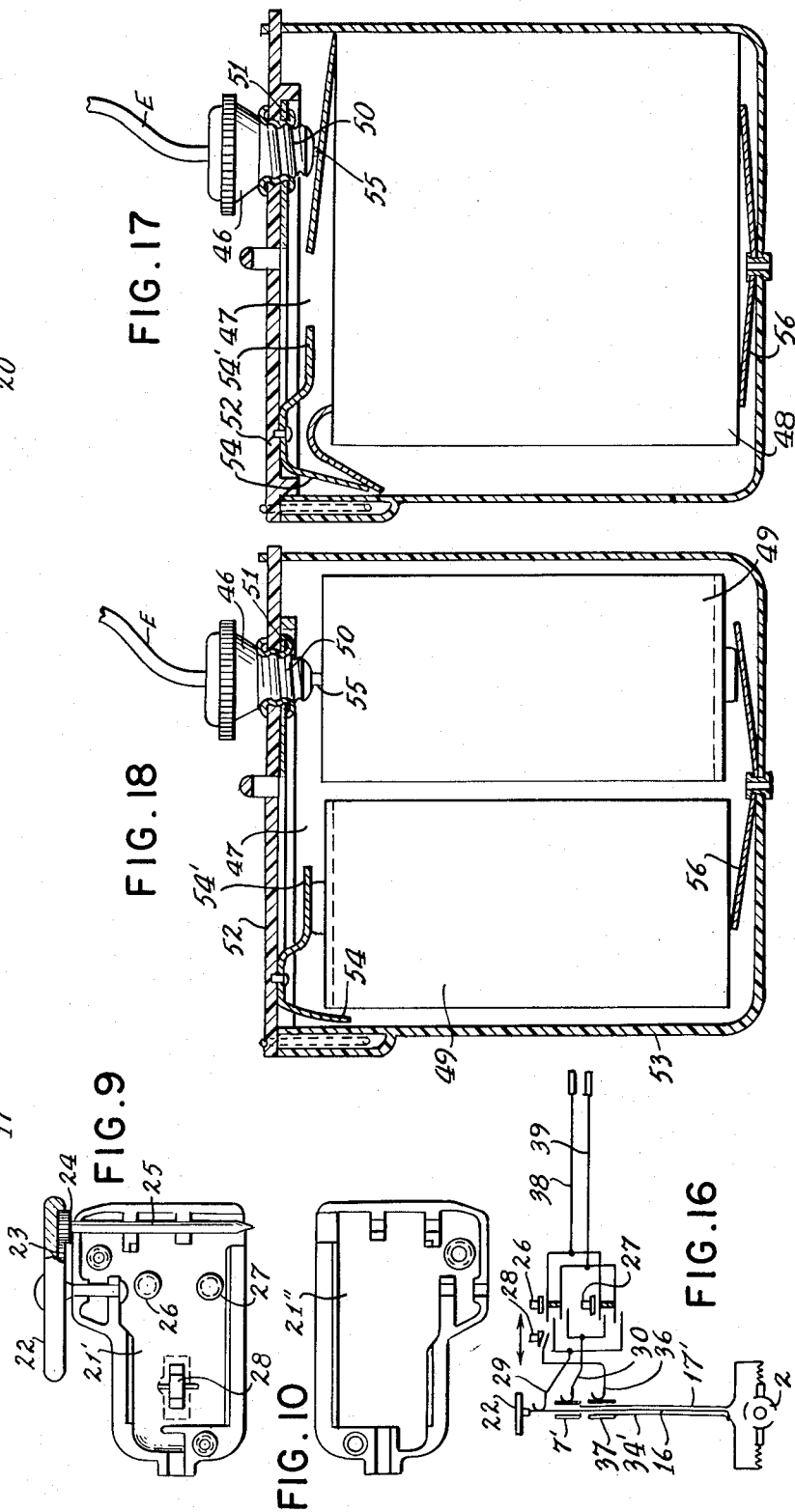
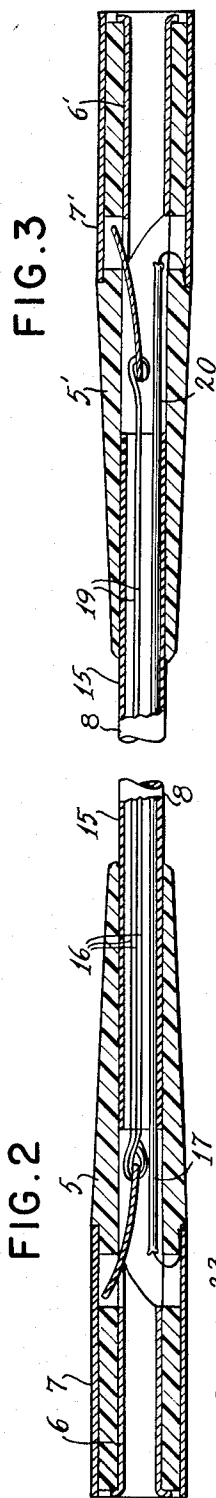
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REMOTELY CONTROLLABLE ELECTRIC TOY

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2 Sheets-Sheet 2



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2,723,492

REMOTELY CONTROLLABLE ELECTRIC TOY

Heinrich Müller, Nurnberg, Germany

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18 Claims. (Cl. 46—244)

My invention concerns remotely controllable electric toys, in particular electrically driven vehicular toys that are remotely steerable by means of a flexible control cable travelling with, or trailing behind, the toy.

It is known to steer spring-driven toy vehicles through a torsionally elastic wire or helical spring trailing behind the toy, but these toys do not operate electrically and do not offer the playing versatility possible with electrically driven devices. As far as remotely controllable electric toy vehicles are concerned, the steering has been effected either by control currents supplied through a travelling electric cable, or by mechanical movements transmitted by a Bowden-wire cable also serving to supply electric current to the propulsion drive. These toy designs are complicated, expensive and troublesome.

It is therefore an object of my invention to avoid such deficiencies.

Another object of my invention is to provide an electrically driven and remotely controllable toy vehicle capable of more versatile playing effects than possible with the known toys of this kind. That is, the invention aims at permitting, by simple and reliable means easy to manufacture, not only a remote steering of the electric toy vehicle but also a remote control of additional playing functions such as switching from forward to reverse travel, shifting between fast and slow travel, starting and stopping, controlling the vehicle illumination or a blink light, sounding a horn, or controlling other optical or acoustical accessories.

According to one of the features of my invention, I provide an electrically driven and remotely controllable toy with a remote-control connection capable of transmitting a mechanical torque to the steering mechanism as well as an electric current to the drive motor.

The control connection is essentially a bendingly flexible electric cable of sufficient torsional rigidity to transmit revolutional movement of one cable end to the other. One end of the cable is revolvably joined with the toy proper and is mechanically connected with the steering mechanism to permit steering the toy by turning the cable, and the same cable end is electrically connected to the drive motor to supply it with electric current. Such a control connection, including the toy components at the transmitting and receiving ends, is not only of utmost simplicity in electrical respects since the leads for only one electric circuit need be contained therein, but it is also a simple unit mechanically, having no parts that, in contrast to a Bowden wire, must slide relative to each other for transmitting the steering torque.

In the simplest case, the torque transmitted by the control cable may directly revolve the steering pin or king pin of the steerable wheel set of the toy vehicle. According to another feature of the invention, however, the toy is preferably provided with a separate control spindle which is set in revolution by the torque transmitted by the remote-control cable and which imparts its revolution by a transmission, for instance an endless belt or string, to the steerable wheels.

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According to another feature of my invention, I provide the toy and the pertaining remote-control cable with means for effecting and/or controlling any of the above-mentioned additional playing functions beyond those directly involved in steering and supplying drive-energizing current. The actuation and/or control of any such additional functions may be mechanical, or electrical, or mechanical as well as electrical. For a mechanical control, and in accordance with a more specific feature of my invention, the remote-control connection is made not only revolvable but also axially displaceable relative to the body of the toy vehicle. Then the connection is also capable of transmitting pulling movements to the body for effecting or controlling the desired additional playing performance. Contrary to a Bowden pull in which only the inner wire performs the movement, the transmission of the pulling movements in a toy according to the just-mentioned feature of my invention is carried out by the remote-control connection as a whole, without individual parts or wires of the connection being displaced relative to the other parts or wires, thus reliably avoiding frictional wear as well as damage to the electric insulation.

According to still another feature of my invention, the transmission of electrical power and mechanical movement to the toy proper through the remote-control connection or cable is controlled by means of a manually operable control device to be held in one hand and to be manipulated by the other hand. This device has a housing in which a manually revolvable control wheel is journaled. Revolution of the wheel is imparted, through a step-up gearing, to an output axle mechanically joined with the remote-control cable. Preferably, the housing of the control device also contains electric switch means for controlling the electric current supply.

According to a further feature of the invention, the control cable is removably attached to the toy body as well as to the manual control device. To this end, the cable structure comprises two end plugs preferably of the same design. Each plug may have two concentric sleeves insulated from each other and mechanically joined with the cable structure to transmit torque, or torque and pull; and the sleeves are electrically connected with the electric leads of the cable to also transmit current. The inner sleeve of one plug is preferably electrically connected with the steering spindle on the body of the toy, while the inner sleeve of the other plug may be similarly connected with the revolvable output shaft of the manual control device. The steering spindle on the toy body may be slidably engaged by a contact spring for the transmission of current; and another contact spring may engage the exterior metal sleeve of the toy-side plug.

Any suitable current source may be used for operating the remotely controllable toy, for instance, portable or stationary batteries, or transformers with or without rectifiers. If a portable battery, especially a flashlight battery is used, it may be disposed within the housing of the above-mentioned manual control device. According to a feature of my invention, however, I prefer placing the battery into a separate, preferably portable casing and connect the casing by a flexible cable with the control device.

According to another feature of my invention, I provide the toy with a resistor for selectively controlling the speed of the electric drive motor by means of a selector switch mounted on the control device, and I design the speed-controlling resistor as a resistance lead in one of the two above-mentioned cables, especially the cable connecting the battery casing with the control device.

The foregoing and more specific objects, features and advantages of my invention will be apparent from, or will

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be mentioned in, the following description of the embodiment and modifications of a toy according to the invention exemplified by the drawing in which:

Fig. 1 is a schematic illustration of a complete toy vehicle;

Fig. 2 shows, on a larger scale, a longitudinal section through one end of the remote-control cable pertaining to the same toy;

Fig. 3 is a longitudinal section through the other end of the control cable;

Figs. 4 to 8 are respectively cross sections of five different modifications of the control cable;

Figs. 9 and 10 are respective views onto the inside of two housing parts of the manual control device pertaining to the toy shown in Fig. 1;

Fig. 11 shows a top view, Fig. 12 a vertical cross section along the line XII—XII, Fig. 13 a side view, and Fig. 14 a bottom view of a contact-carrying insert plate which forms part of the manual control device and is normally enclosed by the housing parts shown in Figs. 9 and 10;

Fig. 15 is a schematic circuit diagram of the toy shown in Figs. 1 and 9 to 14 and comprises a resistance lead in the connection between control device and current source;

Fig. 16 is a somewhat modified circuit diagram comprising a resistance lead in the remote-control cable; and

Figs. 17 and 18 are sectional views of the battery housing shown equipped with a flat battery in Fig. 17, and with two cylindrical batteries in Fig. 18.

The illustrated toy comprises the following main components (Fig. 1): the electrically driven and remotely controllable toy proper, denoted by A, a generally cable-shaped remote-control connection B which has one end secured to the toy vehicle and travels with, or trails behind, the vehicle; a manual control device C at the other end of the control connection; a current-supply unit D here shown as a battery housing; and a flexible connection E between unit D and device C. When the control device C is held in one hand, a control wheel 22 of the device may be turned with the other hand. The revolution is imparted to the control connection B so that its vehicle end revolves relative to the vehicle body for the purpose of controlling the travelling direction. The control device C has a switch 28 for controlling the travelling speed and two selectively operable push button switches 26 and 27 for controlling the vehicle for forward and reverse travel respectively. The control connection B as whole is also movable in its axial direction relative to the toy vehicle. A pull or jerk imposed upon the connection by means of the control device C controls the performance of a vehicle accessory, such as the sounding of a horn. The means for performing these various functions will presently be described more in detail.

The toy vehicle A has a vehicle body 1 equipped with an electric propulsion motor 2. This motor is preferably of the type customary for toys; that is, it may be a commutator motor with a permanent field magnet. The motor 2 is connected to two contact springs 4 and 9, through which it receives electric current. The current is supplied to springs 4 and 9 through the remote control connection B consisting essentially of a cable 8 with two plug type terminals 5 and 5' at its respective ends. The plug 5 is removably connected with a steering spindle 3 which is revolvably mounted on the vehicle body 1 and is also axially displaceable relative to the body. The plug 5 has an inner metal sleeve 6 (Fig. 2) which makes contact with the spindle 3. An exterior metal sleeve 7 of plug 5 makes contact with spring 4. The contact spring 9 engages a metal pulley 10 firmly seated on spindle 3 and electrically connected therewith.

When cable 8 is revolving, the revolution is imparted through spindle 3 to the pulley 10. An endless rubber string transmits the revolution to a pulley 12 secured to the king pin of the front-wheel set of the vehicle. In this

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manner, the control cable B not only supplies current for energizing the drive motor but also operates as a flexible shaft for steering the vehicle.

When the control cable 8 is pulled, the steering spindle 3 moves upwardly and causes the metal pulley 10 to engage a stationary spring contact 13 thus closing the circuit for an accessory device such as the horn 14. When the pull ceases, the spindle 3 drops back into the illustrated position (Fig. 1) so that the horn 14 is again switched out.

The plug terminal 5' at the other end of the control cable 8 (Figs. 1, 3) has an inner metal sleeve 6' and an outer metal sleeve 7' (Fig. 3). These sleeves are preferably designed and arranged in exactly the same manner as the metal sleeves 6 and 7 of plug 5. The sleeves 6' and 7' coact with corresponding parts of the control device C to be described in a later place.

For the design of the cable portion of the remote control connection B there are essentially three alternatives: (1) The structural elements of the control cable serving for the transmission of mechanical torque may be identical with the elements for the transmission of the electric current. (2) The structural elements for torque transmission may be electrically separate from the current-conducting elements. (3) Finally, the structural elements for torque transmission may participate in the current conduction but one or more current leads may also be provided that do not, or not essentially, coact in the transmission of torque.

The torque-transmitting structural elements of the remote-control connection are preferably designed as one or several parallel thin wires of a material of large torsional elasticity, for instance spring steel, spring brass or the like. Three or four wires are preferably used to obtain a symmetrical cross sectional arrangement. This secures a uniform torsional twist even when the control cable is bent, without causing a formation of loops or a jerky transmission.

If the control cable has structural elements which serve substantially only for conducting current, these elements consist preferably of one or several parallel insulated wires, preferably litz wires, of a material of good electric conductivity, for instance copper.

An advantageous embodiment of the remote control cable according to the invention has three steel wires for torque transmission and a fourth wire of insulated copper litz. The three steel wires, in parallel relation, form together one conductor of the electric circuit while the litz wire forms the second conductor. Such a design is shown in Fig. 4. The control cable has three steel wires 16 which serve to transmit torque as well as current, and an insulated copper litz wire 17 serving only for the transmission of current. A tubular hose 15 of artificial material encloses all wires.

Another embodiment of the control cable, shown in Fig. 5, comprises a centrally disposed insulated copper litz wire 17 and three steel wires 16 arranged symmetrically about the litz wire, said wires being embedded in and surrounded by an extrusion-molded covering 18 of plastic or other artificial material.

The embodiment shown in Fig. 6 has four insulated steel wires 20 enclosed by a hose 15 of insulating material. Two of the steel wires 20 form together one circuit lead, and the remaining two wires form the other lead.

Another advantageous embodiment of the remote control connection according to the invention is so constructed that the structural elements transmitting the torsion forces and electric currents consist of preferably four steel wires some of which are insulated, while others are not insulated. Preferably two insulated wires form one current conductor and two non-insulated wires the other current conductor of the same energizing circuit. Such a cable design is illustrated in Fig. 7, showing two non-insulated steel wires 19 and two insulated steel wires 20 which all serve for torque transmission as well as for current transmission and are all enclosed by a hose 15 of artificial ma-

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terial. A similar embodiment shown in Fig. 8 has two non-insulated steel wires 19 and two insulated steel wires 20 enclosed by an extrusion-molded covering 18 of plastic material.

As apparent from Figs. 4 to 8, the structural elements transmitting the torsional forces and those conducting the current are preferably surrounded by a flexible covering which holds the structural elements together, this enclosure being either active or inactive in the torque or force transmission. The covering is designed, for instance, as a hose and is shoved or pulled over the elements. It may also be produced by extrusion-molding a coating around all wire elements. The material of the covering consists preferably of rubber, thermoplastic material or the like. The individual structural elements may be additionally insulated individually even when producing the enclosure by extrusion molding.

The manual control device, denoted as a whole by C in Fig. 1, comprises a housing composed of two parts 21' and 21'' (Figs. 9, 10) which encloses an insulating base plate 32 equipped with contact and terminal means (Figs. 11 to 14). The above mentioned hand wheel 22 for steering the vehicle is revolvably mounted on the housing part 21' (Fig. 9). Wheel 22 has inner gear teeth 23 meshing with a pinion 24 on an axle 25 which is revolvably mounted between the two housing parts 21' and 21'' (Figs. 9, 11). The inner sleeve 6' of plug 5' (Fig. 3) when plugged into the control device, is firmly seated on the free end of axle 25. Consequently, when the wheel 22 is being turned, its revolution is stepped up by the gearing 23, 24 and is imparted by the revolving axle 25 to the plug 5' and hence through the torque-transmitting connection to the steering spindle 3 of the vehicle.

When the control device is in assembled condition, a contact spring 29 (Figs. 11, 13, 14) on the insulating insert plate 32 within the housing of control device C is in frictional engagement with the revolvable axle 25, as is schematically illustrated in Fig. 11. Another contact spring 30 (Figs. 11, 14) on the insulating plate 32 then engages the outer metal sleeve 7' of plug 5' as is also schematically shown in Fig. 11. In this manner the current is transmitted to the remote control cable 8 and hence to the electric parts of the vehicle.

Preferably, and as mentioned above, the manual control device C is equipped with switches such as push-button contacts so that actuation of one push button controls the forward travel and actuation of the other controls the reverse travel. The push buttons may be distinguished by different markings for the different travel directions. They may be mechanically interlocked thus avoiding the possibility of short circuits occurring due to simultaneous actuation of both push buttons. The just-mentioned features are incorporated in the illustrated toy as follows. The push buttons 26 and 27 (Figs. 1, 9) actuate respective contact springs 40 and 40' (Figs. 12, 14, 15). The springs act upon opposite sides of an insulating teeter bar 43 tiltably seated upon the insulating insert plate 32. The teeter bar 43 has legs which bear against respective contact springs 41 or 41' (Figs. 12, 14, 15) so that spring 41 is actuated together with spring 40, and spring 41' together with spring 40'. The teeter bar 43 also operates as a mechanical interlock so that either the springs 40 and 41 only, or the springs 40' and 41' only, can be actuated at a time. Alternately engageable with these contact springs are further contact springs 42, 42', 44 and 44' whereby an alternate depression of buttons 26 and 27 causes a polarity reversal of the current supplied to the springs 29 or 30, thus reversing the running direction of the vehicle propulsion motor.

For adjusting different speeds of the travelling toy, resistors may be switched on and off in the motor circuit. To avoid local overheating of these resistors, at least one of the current leads in the motor circuit are preferably made of resistance wire or resistance litz wire, so that

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the resistor formed by this lead is well cooled due to its great length. This requires providing at least one additional lead of small resistance, for instance copper, and connecting this additional lead with the resistance wire under control by a switch on the manual control device. When the switch is open the toy drive motor runs slow and when the switch is closed it runs fast.

The just-mentioned resistance wire and the additional lead of slight resistance may be arranged within the remote control connection B (Fig. 1). In this case, at least one of the torque transmitting elements of the cable may serve as a resistance wire, for instance, by making this element of a suitably thin steel wire so that it has a higher resistance than a wire of copper or than a normally thick steel wire for torque transmission. However, since the remote control connection B, when being actuated for steering, is revolving relative to the control device C, a design of the type just-mentioned would require the plug 5' to have at least one additional metal sleeve for current conduction, and this would also require at least one additional contact spring in the control device C. According to a preferred feature of the invention, therefore, the resistance wire for speed control is located within the connecting cable E (Fig. 1) between the control device C and the current source D as is illustrated in Fig. 15.

As apparent from Fig. 15, the connecting cable E between the control device and the battery housing contains two copper leads 34, 35 and a lead 33 of resistance material. By displacing the slide button 28 (Figs. 15, 9, 1) a contact spring 31 is actuated and switches the copper lead 31 parallel to resistance lead 33. With this parallel connection, a high travelling speed will result, while otherwise, due to the resistance of lead 33, a lower travelling speed is effective.

When providing a resistance lead in the remote control connection B, the connecting cable E between the control device C and the battery housing need contain only the copper leads 38 and 39. The push buttons 26, 27 then effect the same functions as described above. However, the plug 5 must be given an additional outer metal sleeve 37 for sliding engagement with a contact spring 36, as is shown in Fig. 16. The leads 17' and 34' consist of copper, while 16' has a higher resistance and serves also to transmit torsion forces.

The combination of a hand wheel for remote steering by means of a flexible torque shaft, with two push buttons for the electric control of forward and reverse travel and with a switch for slow and fast travel, within a single small control device to be held in one hand, results in an extremely handy control unit which best satisfies the versatile playing purposes.

The current-source unit D (Fig. 1) of the toy comprises a battery housing 47 (Figs. 17, 18) composed of a lower housing portion 53 and a cover 52. Screwed into the cover 52 is a terminal plug 46 of cable E. The threaded part 50 of plug 46 makes contact with a socket 51 of the battery housing. The center contact 55 of plug 46 makes direct contact with a contact part of an inserted battery. This design has the advantage that a conventional flashlight may be used as a current source by removing the lamp bulb and inserting instead the screw plug 46.

Either a flat battery 43 (Fig. 17) or two round batteries 49 (Fig. 18) may be placed into the housing 47. A spring 56 presses the batteries against contact springs 54 or 54' and against the center contact 55 of plug 46. When two round batteries are inserted, the spring 56 connects both with each other in series relation. The contact springs 54 and 54' are electrically connected with the socket 51.

With a properly modified design, the two batteries 49 may also be used in parallel connection. The switching device may also be so designed that, with a series connection of the two batteries, only one or both batteries

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are effective selectively or that they are selectively connected in series or parallel relation for the purpose of varying the motor voltage and hence the travelling speed. In this case, a resistance wire for adjustment to slow travel may be dispensed with.

A portable battery housing as described may conveniently be carried in a suit pocket, and the portable control device C, since it does not include a current source, can be given a very small and handy shape as well as little weight as essential for children's hands.

It will be obvious to those skilled in the art upon a study of this disclosure that toys according to my invention may be modified in various respects and may be embodied in designs other than specifically illustrated and described, without departing from the essential features of the invention and within the scope of the claims annexed hereto.

I claim:

1. A remotely controlled toy comprising a toy body having a mechanism to be remotely controlled, electrically actuated drive means on said body, a control cable having one end mechanically connected to said mechanism and electrically connected to said drive means, said cable being revolvable with respect to said body, remote control means mechanically and electrically connected to the other end of said control cable, said control cable being bendable and having torsionally resistant means for transmitting controlling torque from said remote control means to said mechanism, said control cable comprising electrical conductor means for supplying said electrically actuated drive means with electric current, and a single jacket enclosing both said torsionally resistant means and said electrical conductor means.

2. An electrically driven vehicular toy, comprising a toy body having a steering mechanism with a revolvable steering member, an electric propulsion motor on said body, and remote-control means having a flexible and revolvable shaft member connected at one end with said steering member for transmitting revolutionary motion thereto, said shaft member comprising a cable having a plurality of mutually-insulated parallel torque-transmitting wires, and means including at least one of said wires electrically connected with said drive motor to supply it with electric current.

3. An electrically driven vehicular toy, comprising a wheeled vehicle body having a steerable wheel set and having a revolvable spindle for steering said set, an electric propulsion motor on said body, and remote control means having a bendingly flexible and torsionally resistant cable comprising a plurality of mutually-insulated, parallel wires, said cable having one end joined with said spindle and being revolvable relative to said body for transmitting revolution to said spindle, and slide contacts disposed on said body and electrically engaging said wires, said contacts being electrically connected with said motor for supplying it with electric current through said cable.

4. A remotely controlled toy comprising a toy body having a mechanism to be remotely controlled, electrically actuated drive means on said body, a control cable having one end mechanically connected to said mechanism and electrically connected to said drive means, said cable being revolvable with respect to said body, remote control means mechanically and electrically connected to the other end of said control cable, said control cable being bendable and having torsionally resistant means for transmitting controlling torque from said remote control means to said mechanism, said torsionally resistant means comprising a spring metal wire, said control cable comprising an electrical conductor connected in circuit with said spring metal wire for supplying said electrically actuated drive means with electric current, and a single jacket of insulating material enclosing both said spring metal wire and said electrical conductor.

5. A remotely controlled toy comprising a toy body having a mechanism to be remotely controlled, electrical-

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ly actuated drive means on said body, a control cable having one end mechanically connected to said mechanism and electrically connected to said drive means, said cable being revolvable with respect to said body, remote control means mechanically and electrically connected to the other end of said control cable, said control cable being bendable and having torsionally resistant means for transmitting controlling torque from said remote control means to said mechanism, said torsionally resistant means comprising a plurality of spring metal wires, said control cable comprising an electrical conductor connected in circuit with said spring metal wires for supplying said electrically actuated drive means with electric current, and a single jacket of insulating material enclosing both said plurality of spring metal wires and said electrical conductor.

6. A remotely controlled toy comprising a toy body having a mechanism to be remotely controlled, electrically actuated drive means on said body, a control cable having one end mechanically connected to said mechanism and electrically connected to said drive means, said cable being revolvable with respect to said body, remote control means mechanically and electrically connected to the other end of said control cable, said control cable being bendable and having torsionally resistant means for transmitting controlling torque from said remote control means to said mechanism, said torsionally resistant means comprising three mutually-uninsulated spring steel wires, said control cable comprising an insulated copper litz wire connected in circuit with said spring steel wires for supplying said electrically actuated drive means with electric current, and a single jacket of insulating material enclosing both said spring metal wires and said litz wire.

7. An electrically driven vehicular toy, comprising a toy body having a steering mechanism with a revolvable steering member, an electric propulsion motor on said body, and remote-control means having a flexible and revolvable shaft member connected at one end with said steering member for transmitting revolution thereto, said shaft member forming an electric cable and being electrically connected with said drive motor to supply it with electric current, said cable comprising a plurality of mutually insulated torque-transmitting wires, said remote-control means having a portable control device secured to the other end of said shaft member and having current supply means electrically connected with said cable, and a manually operable control member revolvably mounted on said device and mechanically connected with said cable to impart revolution thereto.

8. An electrically driven toy, comprising a toy body having a mechanism to be controlled, an electric drive motor on said body, and remote-control means having a bendable and torsionally resistant control cable, said cable having terminal plugs at both ends respectively and having conductor means electrically connected between said plugs, said conductor means comprising a plurality of mutually insulated torque-transmitting wires, said cable comprising an insulating jacket surrounding said wires, one of said plugs being mechanically and detachably joined with said mechanism for imparting controlling torque thereto, contact means disposed on said body and slidably engageable with said one plug, said contact means being electrically joined with said motor for connecting it to said conductor means, said remote-control means having a portable control device at the other end of said cable, said device having a manually revolvable member to which said other plug is detachably joined for revolving said cable, and said device having current supply means including parts slidably engageable with said other plug to pass current through said conductor means.

9. In a toy according to claim 7, said control device having a revolvable pin mechanically joined with said cable, and having a step-up transmission between said revolvable control member and said pin.

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10. An electrically driven toy, comprising a toy body having a mechanism to be controlled, an electric drive motor on said body, and remote-control means having a bendable and torsionally resistant control cable revol- 5
vable relative to said body, said control cable having one end mechanically connected to said mechanism for im-
parting controlling torque to said mechanism and having conductor means electrically connected with said motor
for supplying it with electric current, a portable control 10
device disposed at the other end of said control cable, said device having electric contact means electrically
joined with said cable and having a manually revoluble control member mechanically joined with said cable to
impart revolution thereto, a separate current supply unit, 15
and a flexible connecting cable electrically joining said unit with said contact means of said device.

11. In a toy according to claim 10, said contact means of said portable control device comprising pole reversing switch means for reversing the running direction of said motor, said switch means having two selectively operable 20
and interlocked push button switches.

12. In a toy according to claim 10, one of said two cables comprising a resistance wire, and said portable control device having a switch connected with said resistance wire for selectively connecting it between said motor and said current supply unit to control the motor speed. 25

13. In a toy according to claim 10, said current supply unit having a battery housing and having a screw-thread socket on said housing, and said connecting cable having a screw-plug terminal matching said socket. 30

14. In a toy according to claim 1, said revoluble cable being axially displaceable due to pull relative to said toy body, and accessory means mounted on said toy body and responsive to axial displacement of said cable. 35

15. In a toy according to claim 3, said revoluble spindle being axially displaceable relative to said vehicle body due to pull exerted upon said cable, accessory means disposed on said vehicle body, and electric circuit means connecting said accessory means with said spindle in re-
sponse to axial spindle displacement. 40

16. An electrically driven toy, comprising a toy body having a mechanism to be controlled, an electric drive motor on said body, and remote-control means having a bendable and torsionally resistant control cable revol- 45
vable relative to said body, said control cable having one

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end mechanically connected to said mechanism for im-
parting controlling torque to said mechanism and having conductor means electrically connected with said motor
for supplying it with electric current, a portable control device disposed at the other end of said control cable, said device having electric contact means electrically
joined with said cable and having a manually revoluble control member mechanically joined with said cable to
impart revolution thereto, a separate current supply unit, and a flexible connecting cable electrically joining said
unit with said contact means of said device, said contact means of said device comprising a pole reversing switch
for reversing the running direction of said motor and selective switch means for controlling the motor speed, 15
and one of said two cables having a resistance lead selectively connected by said switch means between said motor and said current supply unit.

17. In an electrically driven toy the combination comprising a toy body having a mechanism to be re-
motely controlled, an electric drive motor on said body, a control cable having one end mechanically connected to said mechanism and electrically connected to said motor and revoluble with respect to said body, remote control means mechanically and electrically connected to the
other end of said control cable, said control cable being bendable and having torsionally resistant means for im-
parting controlling torque from said remote control means to said mechanism, said control cable comprising
electrical conductor means for supplying said motor with electric current, and said control cable comprising a single
bendable jacket surrounding both said torsionally resist-
ant means and said electrical conductor means. 30

18. An electrically driven toy according to claim 17, wherein said electrical conductor means comprises an in-
sulated copper wire, and wherein said torsionally resistant means comprises a plurality of steel wires, at least one of
said steel wires being further adapted to carry electric current in circuit with said copper wire for energizing
said motor. 35

References Cited in the file of this patent

UNITED STATES PATENTS

2,161,971	Muller	June 13, 1939
2,439,054	Mosthof	Apr. 6, 1948
2,638,712	Jackson	May 19, 1953