

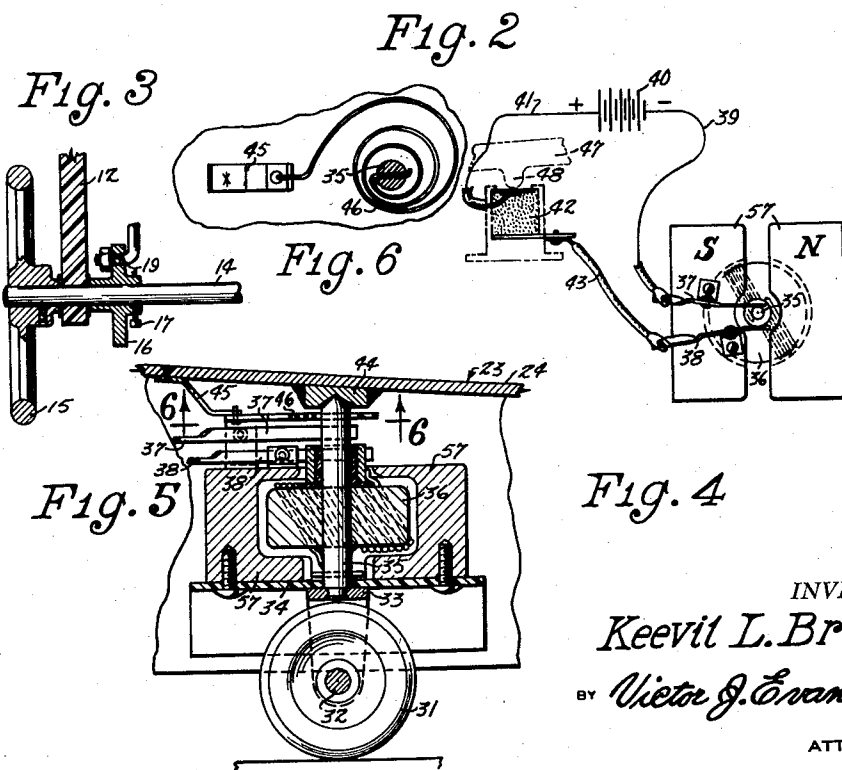
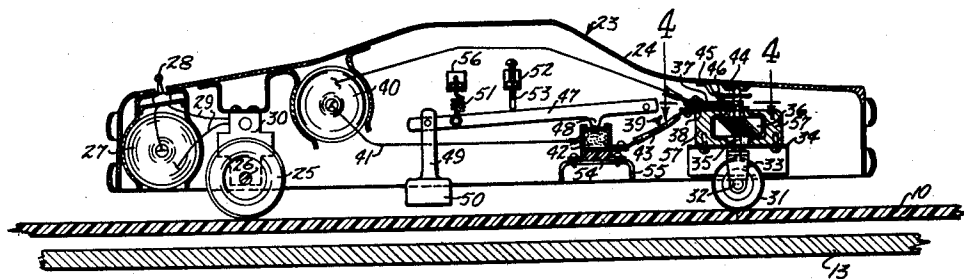
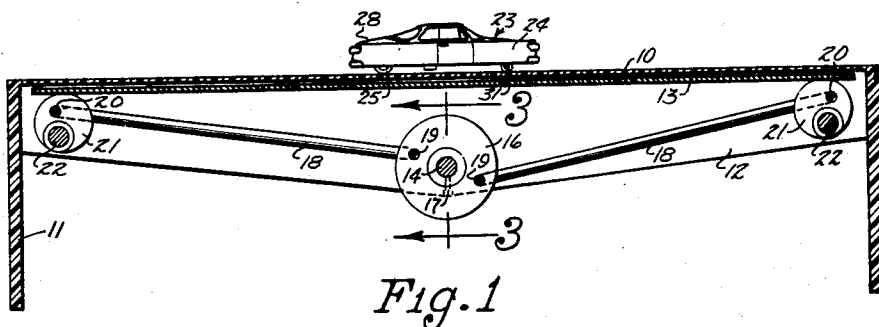
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TOY GUIDED BY REMOTE CONTROL

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TOY GUIDED BY REMOTE CONTROL

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4 Claims. (Cl. 46—239)

This invention relates to a toy or an amusement device, and more particularly to a toy which is guided by remote control.

The object of the invention is to provide a toy which is adapted to be guided by a remote control mechanism so as to permit the toy to be guided or moved as desired by the user.

Another object of the invention is to provide an amusement device which includes a top member that has a movable element such as a toy vehicle mounted for movement therealong, there being a remote control mechanism for steering or guiding the body member or toy vehicle so that the user can derive much pleasure and amusement therefrom.

Another object of the invention is to provide a toy which is guided by remote control, wherein the mechanism is extremely simple and inexpensive to manufacture.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this application, and in which like numerals are used to designate like parts throughout the same.

Figure 1 is a vertical sectional view taken through the apparatus of the present invention.

Figure 2 is an enlarged sectional view showing the vehicle in section.

Figure 3 is a sectional view taken on the line 3—3 of Figure 1.

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

Figure 5 is a vertical sectional view taken through the steering mechanism on the vehicle.

Figure 6 is a sectional view taken on the line 6—6 of Figure 5.

Referring in detail to the drawings, the numeral 10 indicates a top piece which is adapted to be made of a suitable non-magnetic material, and depending from the top piece 10 are walls 11 and 12, Figure 1. Arranged below the top piece 10 is a plate 13 which is made of magnetic material, and the plate 13 is mounted for movement towards and away from the top piece 10. A manual means is provided for moving the plate 13 towards and away from the table top 10, and this means comprises a shaft 14 which extends through the wall 12. A hand wheel 15 is mounted on the outer end of the shaft 14 for rotating the shaft, Figure 3. Also mounted on the shaft 14 is a wheel 16 which is secured to the shaft 14 by means of a set screw 17. A pair of rods 18 each have a transverse portion 19 connected to the wheel 16, and the other end portions 20 of the rods 18 are connected to movable cams 21. The cams 21 are mounted on off center shafts 22 which extend from the wall 12, and the outer edges of the cams 21 engage the movable plate 13. Thus, by manually gripping the handle 15, the shaft 14 can be rotated and this will cause simultaneous movement of the pair of cams 21

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so that the plate 13 can be moved towards and away from the top piece 10, for a purpose to be later described.

Mounted for movement along the nonmagnetic top piece 10 is a body member which is indicated generally by the numeral 23, and the body member 23 may have the configuration of a toy vehicle such as a toy automobile. The body member 23 includes the housing 24 which has rear wheels 25 that are mounted on an axle 26, Figure 2. A battery 27 is supported within the housing 24, and the battery 27 is electrically connected to a conventional electric motor 30 by means of wires 29, actuation of the motor 30 being controlled by a manually operable switch 28. The motor 30 serves to drive the wheels 25 whereby the vehicle 23 can be propelled along the top piece 10.

The vehicle or body member 23 further includes front wheel 31 which is mounted on an axle 32, and the axle 32 is supported by a steering yoke 33. The support member 34 is arranged contiguous to the yoke 33, Figure 5, and extending upwardly from the yoke 33 and connected thereto is a movable shaft 35. The shaft 35 projects through an armature 36. Arranged in engagement with the armature 36 is a pair of contacts 37 and 38. A wire 39 electrically connects the contact 37 to a battery 40, while a wire 41 leads from the battery 40 to a granulated carbon element 42, there being a wire 43 leading from the granulated carbon element 42 to the contact 38. The upper end of the shaft 35 rotatably engages a bearing member 44, and there is further provided a spring member 46 which is connected to the upper portion of the shaft 35, the spring member 46 being connected to a clip 45 which is secured to the housing 24.

A movable lever 47 is arranged within the housing 24, and the lever 47 includes a depending finger 48 which is arranged in engagement with the upper portion of the granulated carbon element 42. An arm 49 is connected to an end of the lever 47, and a permanent magnet 50 is arranged on the lower end of the arm 49. A clip or bracket 56 is secured to a portion of the housing 24, and a coil spring 51 extends between the bracket 56 and the lever 47. There is further provided a bracket 52 which is secured to the housing 24, and an adjustable stop member 53 extends through the bracket 52 and engages the lever 47. The granulated carbon element 42 is supported on a block 54 which is arranged above a base 55, and the base 55 is secured within the housing 24 in any suitable manner.

From the foregoing, it is apparent that there has been provided a remote control mechanism for an amusement device so that a member such as the member 23 can be guided whereby it will move or travel in a desired path or direction. In use, the magnetic plate 13 can be raised or lowered by rotating the handle 15 since this rotation of the handle 15 turns the shaft 14. As the shaft 14 turns, the wheel 16 also turns and this results in movement of the pair of rods 18. As the pair of rods 18 move, the pair of cams 21 are moved on the pins or shafts 22 and since the outer periphery of the cam 20 is arranged in engagement with the lower surface of the magnetic plate 13, it will be seen that this will result in up or down movement of the plate 13. Thus, the magnetic attraction between the plate 13 and the permanent magnet 50 will vary according to the position of the magnetic plate 13. The toy vehicle 23 is adapted to be propelled or driven around the top piece 10 by means of the motor 30 which is energized by the battery 27, and this actuation of the motor 30 is controlled by the hand switch 28. Actuation of the motor 30 results in rotation of the rear wheels 25 so

that the vehicle 23 will be propelled along the top piece 10 which is made of a nonmagnetic material.

The steering or guiding of the vehicle is accomplished due to the previously described attraction between the permanent magnet 50 and the magnetic plate 13. Thus, the magnetic attraction between the plate 13 and magnet 50 will result in pivotal movement of the lever 47 so that the finger 48 will engage the upper end of the carbon element 42 with different amounts of pressure. Thus, the electrical current flowing through the carbon element 42 will be varied according to the amount of pressure being exerted by the finger 48 and this pressure is determined by the position of the plate 13 which in turn is regulated by the handle 15. This electrical current which flows through the carbon element 42 passes from the battery 40 to the armature 36, and the armature 36 is mounted on the rotary shaft 35. The lower end of the shaft 35 is connected to the yoke 33 which supports the front wheel 31 and the yoke 33 is arranged below the support member 34. The armature 36 is positioned between a pair of permanent magnets 57 so that as electrical energy is supplied from the carbon element 42, the armature 36 will rotate and this will cause turning movement of the wheel 31, the amount of the turning movement of the wheel 31 being determined by the amount of electrical current flowing through the carbon element 42.

The spring member 46 serves to return the armature to its zero position.

Thus, it will be seen that there has been provided a toy or model vehicle which is adapted to be guided by remote control and the apparatus includes a self-propelled toy vehicle with a means for guiding the vehicle by remote control and there is further provided the special type of table or top piece 10. The remote control operation is obtained by varying the current flow from a dry cell battery to a moving coil of an electric instrument, and the moving coil is attached to the steering wheels. The variation of the current flow is obtained by varying the pressure on the granulated carbon element 42 which is in the electric circuit and pressure variation of the element 42 is obtained by varying the magnetic pulling force exerted by the magnet 50 which is attracted to the adjustable metal plate 13.

In Figure 1 the toy car 23 is shown mounted on a table or top 10 and the present invention utilizes a permanent magnet moving coil type of electric instrument. The granulated carbon element 42 has the same principle of operation as a conventional carbon microphone vibrating element which is used in microphones and telephones.

In actual operation, to guide the unit, current flows from the dry cell battery 40 through the granulated carbon element 42, to the permanent magnet moving coil electric instrument and more particularly to the armature 36 thereof. The shaft 35 of the moving coil or armature is attached to the steering wheel yoke 33 and only one wheel 31 is used for steering, and this wheel is supported by a suitable bearing assembly such as the bearing 44 whereby as much friction as possible is eliminated. The coil spring 46 is used to return the moving coil towards its zero position when the current is decreased, and the moving coil or armature 36 is enclosed partially by the stationary permanent magnet 57. The amount of current flowing in the circuit depends on the pressure exerted by the finger 48 since the granulated carbon will be more conductive to electricity as it is compressed. The permanent magnet 50 is attracted by the metal plate 13 and this force is exerted on the carbon element 42 through the previously described lever and finger arrangement. The spring 51 serves to compensate for the weight of the magnet only, and will result in no pressure being applied on the element 42 when the plate 13 is far enough away not to attract the magnet 50. The adjusting stop 53 serves to keep the magnet 50 in its proper position.

The table top 10 is made of a smooth thin nonmagnetic

material of sufficient strength and may be made of a suitable material such as plastic, aluminum, glass or the like and the top piece 10 is stationary. The plate of magnetic material 13 may be made of a suitable material such as iron or steel and the vertical position of this plate 13 can be adjusted by turning the wheel 15. Thus, by turning the wheel or handle 15 in one direction, the plate 13 can be raised, and by turning the wheel in the other direction, the plate 13 can be lowered so that the distance between the metal plate 13 and the magnet 50 can be varied as desired. Thus, the magnet 50 will have a greater pull downward when the plate 13 is brought closer thereto so that the magnet will cause more pressure to be exerted on the carbon element 42 which will cause more current to flow in the electric circuit and this will cause the moving armature or coil 36, which is attached to the steering wheel 31, to be rotated or deflected in a predetermined direction, such as to the left.

I claim:

1. In an amusement device, a horizontally disposed top piece of nonmagnetic material, a horizontally disposed metal plate arranged below said top piece, manually operable means for moving said plate towards and away from said top piece, a movable body member mounted on said top piece and including an outer housing, said body member including rear wheels, a motor connected to said rear wheels for driving said rear wheels, a battery positioned in said body member and electrically connected to said motor, a switch electrically connected to said motor for controlling actuation of said motor, a base mounted in said body member, a granulated carbon element supported on said base, a lever movably mounted in said body member and including a depending finger engaging the upper portion of said carbon element, a depending arm connected at its upper end to an end of said lever, a permanent magnet on the lower end of said arm, a coil spring having one end connected to said lever and the other end anchored to the housing of said body member, a bracket secured to the housing of said body member, an adjustable stop member projecting through said bracket and engaging said lever, a second battery positioned in said body member, a movable front steering wheel arranged in the front portion of said housing, an axle connected to said front wheel, a yoke connected to said axle, a support member connected to said yoke, a shaft extending upwardly from said yoke, an armature mounted on said last named shaft, a bearing in said housing for rotatably receiving the upper end of said last named shaft, a pair of permanent magnets secured to said support member and surrounding said armature, contacts connected to said armature, conductor wires connecting said contacts to said second battery and to said granulated carbon elements, and a spring member having one end connected to the upper portion of said last named shaft and a clip connecting the other end of said spring member to said housing.

2. The structure as defined in claim 1 wherein said body member has the configuration of a toy vehicle.

3. In an amusement device, a horizontally disposed top piece of nonmagnetic material, a horizontally disposed metal plate arranged below said top piece, manually operable means for moving said plate towards and away from said top piece, a movable body member mounted on said top piece and including an outer housing, said body member including rear wheels, a motor connected to said rear wheels for driving said rear wheels, a battery positioned in said body member and electrically connected to said motor, a switch electrically connected to said motor for controlling actuation of said motor, a base mounted in said body member, a granulated carbon element supported on said base, a lever movably mounted in said body member and including a depending finger engaging the upper portion of said carbon element, a depending arm connected at its upper end to an end of said lever, a permanent magnet on the lower end of said arm, a coil spring

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having one end connected to said lever and the other end anchored to the housing of said body member, a bracket secured to the housing of said body member, an adjustable stop member projecting through said bracket and engaging said lever, a second battery positioned in said body member, a movable front steering wheel arranged in the front portion of said housing, an axle connected to said front wheel, a yoke connected to said axle, a support member connected to said yoke, a shaft extending upwardly from said yoke, an armature mounted on said last named shaft, a bearing in said housing for rotatably receiving the upper end of said last named shaft, a pair of permanent magnets secured to said support member and surrounding said armature, contacts connected to said armature, conductor wires connecting said contacts to said second battery and to said granulated carbon elements, a spring member having one end connected to the upper portion of said last named shaft, a clip connecting the other end of said spring member to said housing said body member having the configuration of a toy vehicle, and wherein the manually operable means for moving the plate comprises a horizontally disposed shaft, a side wall depending from said top piece and having said last named shaft extending therethrough, a handle connected to the outer end of said last named shaft, a wheel connected to said last named shaft, a pair of rods each having one end connected to said wheel, a pair of cams journaled on said side wall and connected to the other

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ends of said rods and said cams engaging the lower surface of said plate.

4. In combination, a top piece of nonmagnetic material, a movable plate arranged below said top piece, said plate and top piece being arranged in parallel planes, manually operable means for moving said plate towards and away from said top piece, said last said means comprising a horizontally disposed shaft extending transversely of said plate, a handle connected to one end of said shaft, a wheel connected to the opposite end of said shaft, a pair of rods each having one end connected to said wheel and extending in opposite directions from each other longitudinally of said plate, a cam connected to the opposite end of each rod and positioned for engagement with the lower surface of said plate, a body member movably mounted on said top piece, and magnetic means for guiding said body member responsive to the position of said plate.

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