Oct. 14, 1958 A. BASHOVER 2,855,723

MECHANICAL MEMORY DEVICE

Filed Feb. 15, 1956 2 Sheets-Sheet 1

Fig. 1

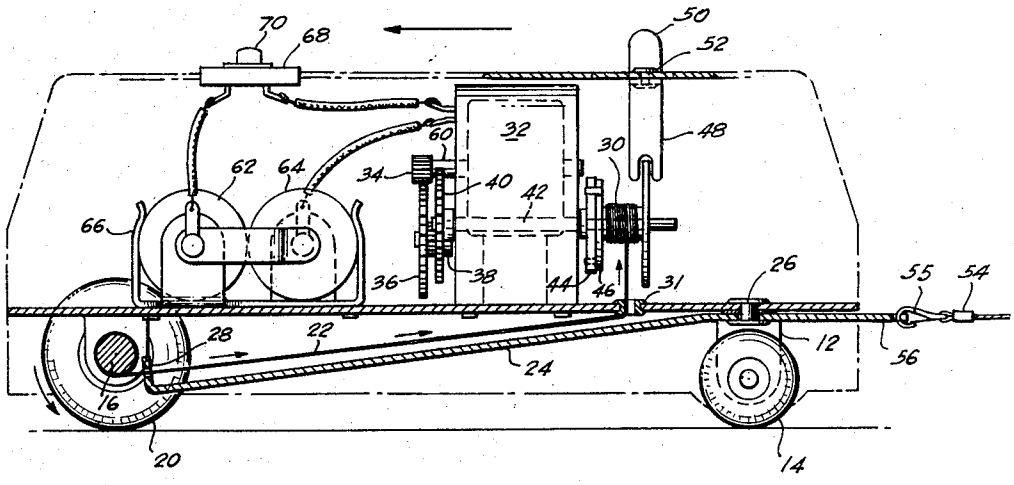
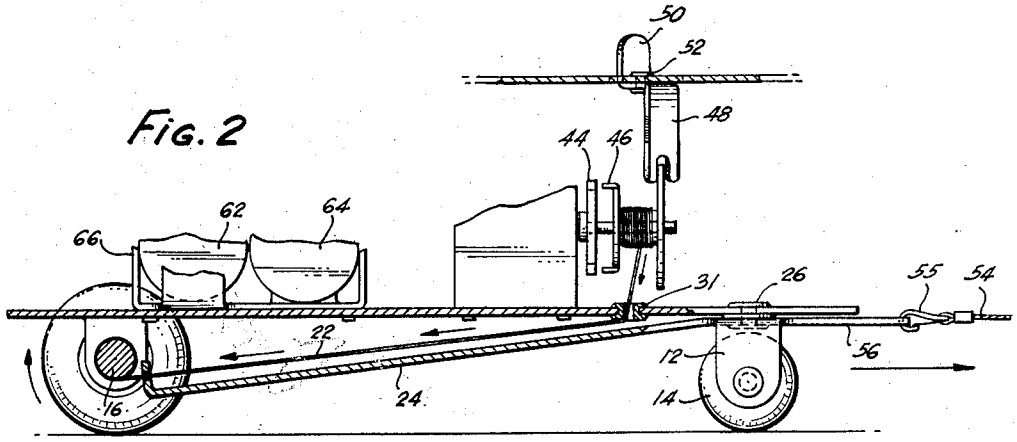


Fig. 2



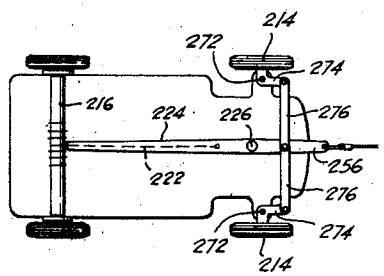


Fig. 6

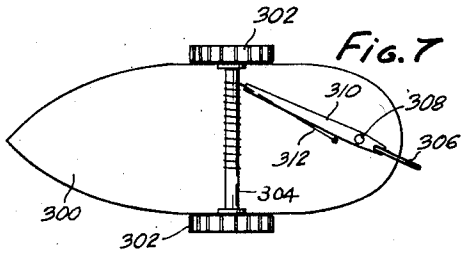


Fig. 7

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MECHANICAL MEMORY DEVICE

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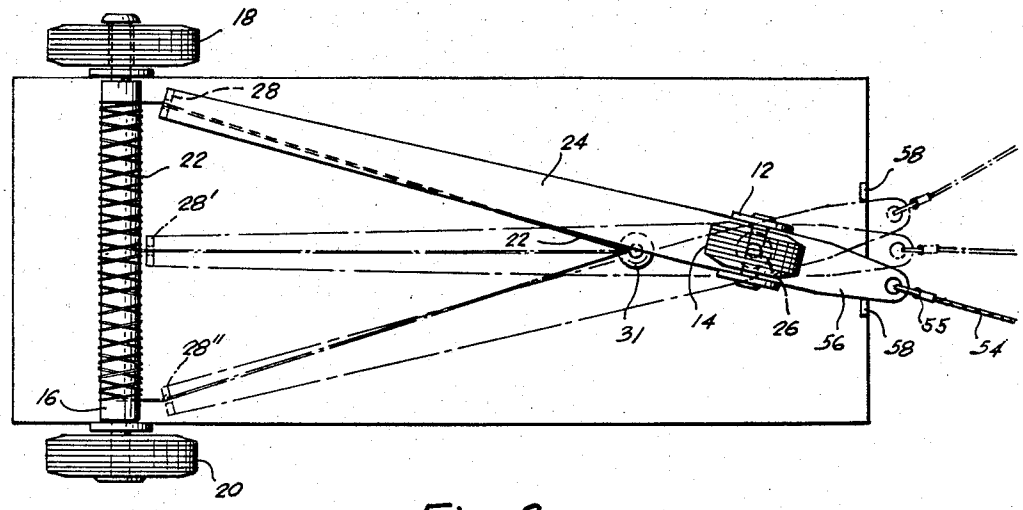
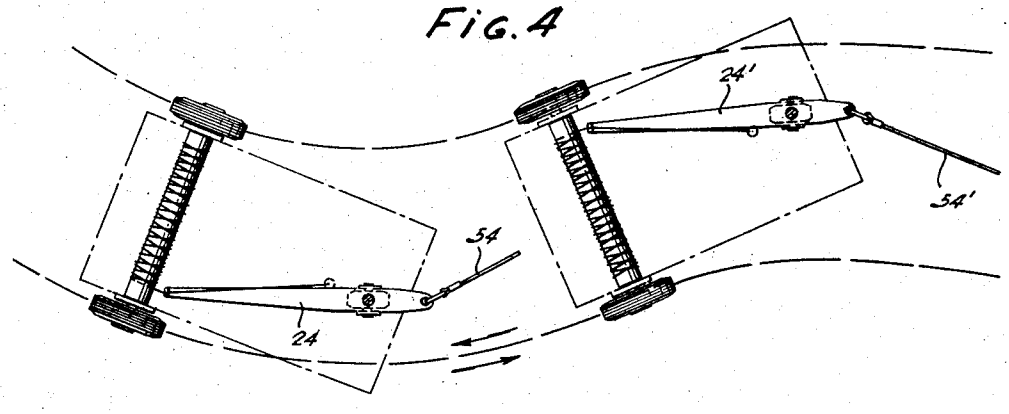


FIG. 3

FIG. 4



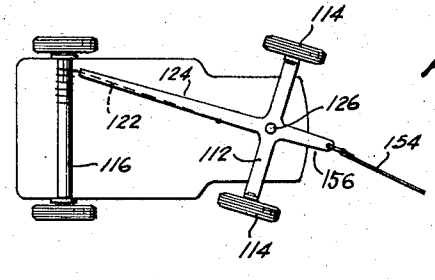


FIG. 5

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United States Patent Office 2,855,723 Patented Oct. 14, 1958

2,855,723

MECHANICAL MEMORY DEVICE

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Application February 15, 1956, Serial No. 565,558

13 Claims. (Cl. 46—244)

This invention relates to memory devices, and more particularly to a mechanical course memory device.

The primary object of the invention is to generally improve memory devices. A more particular object is to provide a memory device which mechanically inter-relates the motion of a slowly moving member with a more rapidly rotating shaft of appreciable length.

A still more particular object is to provide a memory device forming a part of a vehicle, and acting to inter-relate the motion of the vehicle with the steering of the vehicle. For this purpose a slowly moving steering member is inter-related with a propulsion shaft. A still further object is to proved an externally accessible control means connected to the steering member to steer the vehicle over a desired course, which course later is reproduced automatically by the mechanism.

To accomplish the foregoing general objects, and other more specific objects which will hereinafter appear, my invention resides in the memory device elements, and their relation one to another, as are hereinafter more particularly described in the following specification. The specification is accompanied by drawings, in which:

Fig. 1 is a longitudinal section taken in elevation through a toy vehicle embodying features of my invention;

Fig. 2 is a fragmentary view similar to Fig. 1, but showing a clutch in disengaged position;

Fig. 3 is a bottom plan view of the toy;

Fig. 4 is a schematic view explanatory of the operation of the invention;

Fig. 5 is a bottom plan view showing a modification;

Fig. 6 is a similar view showing another modification; and

Fig. 7 is explanatory of still another modification.

Referring to the drawings, and more particularly to Figs. 3 and 4, the memory device comprises a slowly moving member, in this case the yoke 12 of a steering wheel 14, and a rapidly rotating shaft 16 of appreciable length, in this case the propulsion shaft or axle 16 of wheel 20. Wheels 18 and 20 both may be secured to axle 16, but in the present case only wheel 20 is secured to the axle, and wheel 18 is freely rotatable, in order to compensate for a difference in rotation on curves.

A thread 22, herein referred to as a cable, extends to the shaft 16. A linkage, in this case simply a lever 24 pivoted at 26, includes a part 28 which is slidably engaged by the cable 22. The part 28 is movable axially of the shaft 16, as is shown by the positions 28, 28' and 28'', thereby distributing the winding of the cable 22 on the shaft 16. Another part of the lever 24 is connected to the slowly moving member, and in the present case the yoke 12 is formed integrally with the lever so that both are pivoted at 26 and move together.

With this arrangement it will be evident that the winding of the cable 22 on shaft 16 will be distributed in any desired pattern along the shaft 16 in response to the movement of the slowly moving member 12 when

the cable is being wound on shaft 16, and that, conversely, when the cable is being unwound from shaft 16 it will substantially reproduce the movement of the member 12 in reverse sequence.

Referring now to Figs. 1 and 2 as well as Fig. 3 of the drawings, the toy comprises a take-up drum 30 on which the other end of cable 22 is wound. This might be employed merely to take up any free length of cable, in which case the cable would be used solely for memory or steering purposes. However, in the present case the cable is also used for propulsion purposes. Thus the vehicle is provided with a motor 32 for driving the drum 30, and when the motor drives drum 30 in proper direction to wind cable 22 on drum 30 the resulting rotation of axle 16 and wheel 20 propels the vehicle. In the present case the vehicle simulates a bus, and is generally symmetrical end for end. When under motor propulsion the vehicle moves from right to left as viewed in Fig. 1 of the drawing. The cable passes through a smooth eyelet 31, but may more elaborately pass over a pulley.

The motor 32 may drive drum 30 through appropriate gearing and a clutch. In the present case there is reduction gearing comprising pinion 34, driving a gear 36, carrying a pinion 38, driving a gear 40 on clutch shaft 42. The clutch comprises a driving member 44 and a driven member 46, the latter being axially movable by means of a control lever 48 which is operated by a handle 50 around a pivot 52. Fig. 2 shows the crank shape of the lever 48, 50, and shows the clutch parts 44 and 46 in disengaged position. It will be evident that at this time the cable 22 may be readily wound on shaft 16, as by pulling the vehicle in a direction from left to right by means of a pull cord 54.

Reverting to Fig. 3, the pull cord 54 is connected, as by means of a snap-hook or clip 55, to an arm 56 which is operatively connected to the slowly moving or steering member 12. In the present case arm 56 is simply an extension of lever 24. Thus the guide or steering position of wheel 14 may be changed by pulling cord 54 in one direction or another. The steering movement may, if desired, be limited, as by means of stops 58.

Expressed differently, I provide an externally accessible control means (in this case the cord 54) which is connected to the steering member to steer the vehicle over any desired course while the cable 22 is being wound on the axle 16. Thereafter by engaging the clutch and operating the motor the vehicle is propelled in opposite direction and retraces the course originally traced under external control. This will be clear from inspection of Fig. 4. The original or externally applied course is in a direction from left to right. With the cord in position 54 the linkage 24 has been pulled over to one extreme position, as shown. In position 54' the linkage 24' has been pulled over to its other extreme position, as shown. Thus the vehicle traces a sinuous or reverse curve. At the end of any desired course the cord 54 may be unhooked, or if not removable may be tucked into a suitable pocket or recess in the vehicle, or may even drag loosely on the floor. On starting the driving motor the vehicle moves from right to left, and retraces substantially the same course. The term "substantially" is used because there is a slight loss in winding the cable, relative to the steering motion, and a slight loss of steering motion when unwinding the cable.

Reverting to Figs. 1 and 2, in the present case the motor 32 is an electric motor having a motor shaft 60. It is designed to operate on power supplied by a pair of battery cells of the flashlight type, shown at 62 and 64. These are mounted in a suitable spring holder 66 provided with connections for wiring the cells, preferably in series,

but depending on the voltage for which the motor is designed. A control switch **68** is preferably connected in the wiring, and is operated by a button **70** accessible outside the vehicle body.

In Figs. 1 through 4 I have for simplicity shown the use of a single guide wheel **14** which acts to steer the vehicle. However, the vehicle may be provided with a pair of guide wheels, and this minor modification of the invention is shown in Fig. 5, in which the linkage again consists of a simple lever **124** pivoted at **126** and having an extension **156**, substantially as previously described, but in this case the yoke **12** is replaced by a cross arm **112** carrying a pair of spaced guide wheels **114**. The axle **116**, cable **122**, and pull cord **154** may all be substantially as previously described.

Of course, the linkage to the guide wheels may be more elaborate, and the wheels may be pivoted on king pins located near the wheels, in greater resemblance to an automobile or bus. Such an arrangement is shown in Fig. 6 in which guide wheels **214** are pivoted at **272** and are turned by arms **274**. These are connected by links **276** to the forward end or extension **256** of a lever **224** pivoted at **226**. Lever **224** controls or/and is controlled by a cable **222** wound on a propulsion shaft **216**, all as previously described.

It will be understood that the vehicle need not simulate a car or bus. It may be a figure toy simulating a four-legged animal mounted on wheels. However, considered in still broader aspect, the toy, even if a vehicle toy, need not be a wheeled vehicle toy. For example, it might be a boat, and such a modification is schematically illustrated in Fig. 7 in which the boat 300 is assumed to be driven by side paddle wheels **302**. These are mounted on a propulsion shaft **304**. The boat is steered by a rudder **306** which swings about an upright shaft **308** to which a lever **310** is connected. This guides or/and is guided by a cable **312** wound on propulsion shaft **304**.

The operation of the boat shown in Fig. 7 will be understood by analogy to the toy previously described in connection with Figs. 1, 2 and 3, except that in the case of a boat the course would not likely be impressed by moving the boat over the same course in reverse direction. Instead any arbitrary desired course is impressed on the mechanism by turning the rudder under external control while rotating the paddle wheels in such direction as to wind the cable **312** on the propulsion shaft **304**. This may be done manually, or the switch **68** shown in Fig. 1 may be changed to a reversing switch, and the clutch **44**, **46** may be elaborated to permit engagement of the motor to either the drum or the propulsion shaft, or the clutch may be omitted and the motor geared to both simultaneously. While the cable is wound on the propulsion shaft, a desired course is impressed on the mechanism by appropriately moving the rudder. By subsequently reversing the motor (and engaging the clutch if one is used) the boat will operate in forward direction and take a course corresponding to that impressed on the rudder, but in reverse sequence. The propulsion shaft may drive a screw propeller shaft instead of a paddle wheel.

It is believed that the construction and method of use of my improved memory device, as well as the advantages thereof, will be apparent from the foregoing detailed description. It will also be apparent that while I have shown and described the invention in several preferred forms, changes may be made in the structures shown, without departing from the scope of the invention, as sought to be defined in the following claims. In the claims the term "cable" is employed for convenience, but it will be understood that this may be a thread of fibrous material, natural or synthetic, or it may be a very thin flexible wire, either a single strand or woven strands. A nylon thread such as is employed for fish lines has been found satisfactory for the present purpose.

I claim:

1. A course memory device to inter-relate the motion of a vehicle with the steering of the vehicle, said device comprising propulsion motor means, a drum driven thereby, a propulsion shaft of appreciable length for propelling the vehicle, a slowly moving steering member for steering the vehicle, a long cable extending from said drum to said propulsion shaft to be wound on either, a linkage including a part connected to the steering member and another part slidably engaged by the cable and moving axially of the propulsion shaft to distribute the winding of the cable along the propulsion shaft in response to the movement of the steering member when the cable is being wound on the propulsion shaft, and to reproduce the movement of the steering member when the motor means unwinds the cable from the propulsion shaft to propel the vehicle.

2. A course memory device to inter-relate the motion of a vehicle with the steering of the vehicle, said device comprising propulsion motor means, a clutch and drum driven thereby through appropriate gearing, a propulsion shaft of appreciable length for propelling the vehicle, a slowly moving steering member for steering the vehicle, a long cable extending from said drum to said propulsion shaft to be wound on either, a linkage including a part connected to the steering member and another part slidably engaged by the cable and moving axially of the propulsion shaft to distribute the winding of the cable along the propulsion shaft in response to the movement of the steering member when the cable is being wound on the propulsion shaft, and to reproduce the movement of the steering member when the clutch is engaged and the motor means drives the drum to unwind the cable from the propulsion shaft to propel the vehicle.

3. A course memory device to inter-relate the motion of a wheeled vehicle with the steering of said vehicle, said device comprising an axle of appreciable length carrying driving wheels, a steering member operatively connected to one or more steering wheels, a take-up drum, a long cable extending from said drum to said axle to be wound on either, a linkage including a part connected to the steering member and another part slidably engaged by the cable and moving axially of the axle to distribute the winding of the cable along the axle in response to the movement of the steering member when said cable is being wound on the axle, and to reproduce the movement of said steering member when the cable is unwound from the axle onto the drum.

4. A course memory device to inter-relate the motion of a wheeled vehicle with the steering of said vehicle, said device comprising an axle of appreciable length carrying driving wheels, a steering member operatively connected to one or more steering wheels, a take-up drum, a long cable extending from said drum to said axle to be wound on either, a linkage including a part connected to the steering member and another part slidably engaged by the cable and moving axially of the axle to distribute the winding of the cable along the axle in response to the movement of the steering member when said cable is being wound on the axle, and to reproduce the movement of said steering member when the cable is unwound from the axle onto the drum, and externally accessible control means connected to the steering member to steer the vehicle over any desired course while the cable is being wound on the axle.

5. A course memory device to inter-relate the motion of a wheeled vehicle with the steering of said vehicle, said device comprising an axle of appreciable length carrying driving wheels, a steering member operatively connected to one or more steering wheels, a take-up drum, a long cable extending from said drum to said axle to be wound on either, a linkage including a part connected to the steering member and another part slidably engaged by the cable and moving axially of the axle to distribute the winding of the cable along the axle in response to the

movement of the steering member when said cable is being wound on the axle, and to reproduce the movement of said steering member when the cable is unwound from the axle onto the drum, a pull cord for pulling said vehicle, and means connecting said pull cord to said steering member in such fashion that the pull cord may be used to steer and pull the vehicle over any desired course while winding the cable on the axle, following which said cable causes the vehicle to retrace the same course when the cable is unwound from the axle.

6. A course memory device to inter-relate the motion of a wheeled vehicle with the steering of said vehicle, said device comprising an axle of appreciable length carrying driving wheels, a steering member carrying or connected to one or more steering wheels, motor means, a drum driven thereby, a long cable extending from said drum to said axle to be wound on either, a linkage including a part connected to the steering member and another part slidably engaged by the cable and moving axially of the axle to distribute the winding of the cable along the axle in response to the movement of the steering member when said cable is being wound on the axle, and to reproduce the movement of said steering member when the motor means unwinds the cable from the axle to propel the vehicle.

7. A course memory device to inter-relate the motion of a wheeled vehicle with the steering of said vehicle, said device comprising an axle of appreciable length carrying driving wheels, a steering member carrying or connected to one or more steering wheels, motor means, a drum driven thereby, a long cable extending from said drum to said axle to be wound on either, a linkage including a part connected to the steering member and another part slidably engaged by the cable and moving axially of the axle to distribute the winding of the cable along the axle in response to the movement of the steering member when said cable is being wound on the axle, and to reproduce the movement of said steering member when the motor means unwinds the cable from the axle to propel the vehicle, and externally accessible control means connected to the steering member to steer the vehicle over any desired course while the cable is being wound on the axle.

8. A course memory device to inter-relate the motion of a wheeled vehicle with the steering of said vehicle, said device comprising an axle of appreciable length carrying driving wheels, a steering member carrying or connected to one or more steering wheels, motor means, a drum driven thereby, a long cable extending from said drum to said axle to be wound on either, a linkage including a part connected to the steering member and another part slidably engaged by the cable and moving axially of the axle to distribute the winding of the cable along the axle in response to the movement of the steering member when said cable is being wound on the axle, and to reproduce the movement of said steering member when the motor means unwinds the cable from the axle to propel the vehicle, a pull cord for pulling said vehicle, and means connecting said pull cord to said steering member in such fashion that the pull cord may be used to steer and pull the vehicle over any desired course while winding the cable on the axle, and said motor means may then be used to retrace the same course while propelling the vehicle by unwinding the cable from the axle.

9. A course memory device to inter-relate the motion of a wheeled vehicle with the steering of said vehicle, said device comprising an axle of appreciable length carrying driving wheels, a steering member carrying or connected to one or more steering wheels, propulsion motor means, a clutch and drum driven thereby through appropriate gearing, a long cable extending from said drum to said axle to be wound on either, a linkage including a part connected to the steering member and another part slidably engaged by the cable and moving axially of the

axle to distribute the winding of the cable along the axle in response to the movement of the steering member when said cable is being wound on the axle, and to reproduce the movement of said steering member when the clutch is engaged and the motor means drives the drum to unwind the cable from the axle to propel the vehicle.

10. A course memory device to inter-relate the motion of a wheeled vehicle with the steering of said vehicle, said device comprising an axle of appreciable length carrying driving wheels, a steering member carrying or connected to one or more steering wheels, propulsion motor means, a clutch and drum driven thereby through appropriate gearing, a long cable extending from said drum to said axle to be wound on either, a linkage including a part connected to the steering member and another part slidably engaged by the cable and moving axially of the axle to distribute the winding of the cable along the axle in response to the movement of the steering member when said cable is being wound on the axle, and to reproduce the movement of said steering member when the clutch is engaged and the motor means drives the drum to unwind the cable from the axle to propel the vehicle, and externally accessible control means connected to the steering member to steer the vehicle over any desired course while the cable is being wound on the axle.

11. A course memory device to inter-relate the motion of a wheeled vehicle with the steering of said vehicle, said device comprising an axle of appreciable length carrying driving wheels, a steering member carrying or connected to one or more steering wheels, propulsion motor means, a clutch and drum driven thereby through appropriate gearing, a long cable extending from said drum to said axle to be wound on either, a linkage including a part connected to the steering member and another part slidably engaged by the cable and moving axially of the axle to distribute the winding of the cable along the axle in response to the movement of the steering member when said cable is being wound on the axle, and to reproduce the movement of said steering member when the motor means unwinds the cable from the axle to propel the vehicle, a pull cord for pulling said vehicle, and means connecting said pull cord to said steering member in such fashion that the pull cord may be used to steer and pull the vehicle over any desired course while winding the cable on the axle, and by engaging said clutch said motor means may then be used to retrace the same course while propelling the vehicle by driving the drum to unwind the cable from the axle.

12. A memory device to inter-relate the motion of a slowly moving directional control member with a relatively fast turning propulsion shaft of appreciable length, said device comprising a drum, a cable extending from said drum to said propulsion shaft to be wound on either, a linkage including a part connected to the directional control member, and another part slidably engaged by the cable and movable axially of the propulsion shaft to distribute the winding of the cable along said shaft in response to the movement of said member when said cable is being wound on said shaft, and to reproduce the movement of said member when said cable is unwound from said shaft onto the drum.

13. A memory device for a vehicle to interrelate the motion of a slowly moving directional control member of the vehicle with a relatively fast turning vehicle propulsion shaft of appreciable length, said device comprising a cable extending to said propulsion shaft, the latter being rotatable in one direction to wind the cable thereon on the movement of the vehicle over a desired course and rotatable in an opposite direction on the unwinding of the cable from said shaft to drive the vehicle and retrace said course, a linkage including a part connected to the directional control member, and another part slidably

engaged by said cable and movable axially of the propulsion shaft to distribute the winding of the cable along said shaft in response to the directional control movement of said member when said cable is being wound on said shaft on the movement of the vehicle over a desired course, and to reproduce the directional control movement of said member and drive the vehicle when said cable is being unwound from said shaft to thereby retrace said course.

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