Jan. 19, 1960 J. M. R. LEBLIC 2,921,408

TOY AUTOMOBILE CONTROLLABLE FROM A DISTANCE

Filed Aug. 8, 1957 3 Sheets-Sheet 1

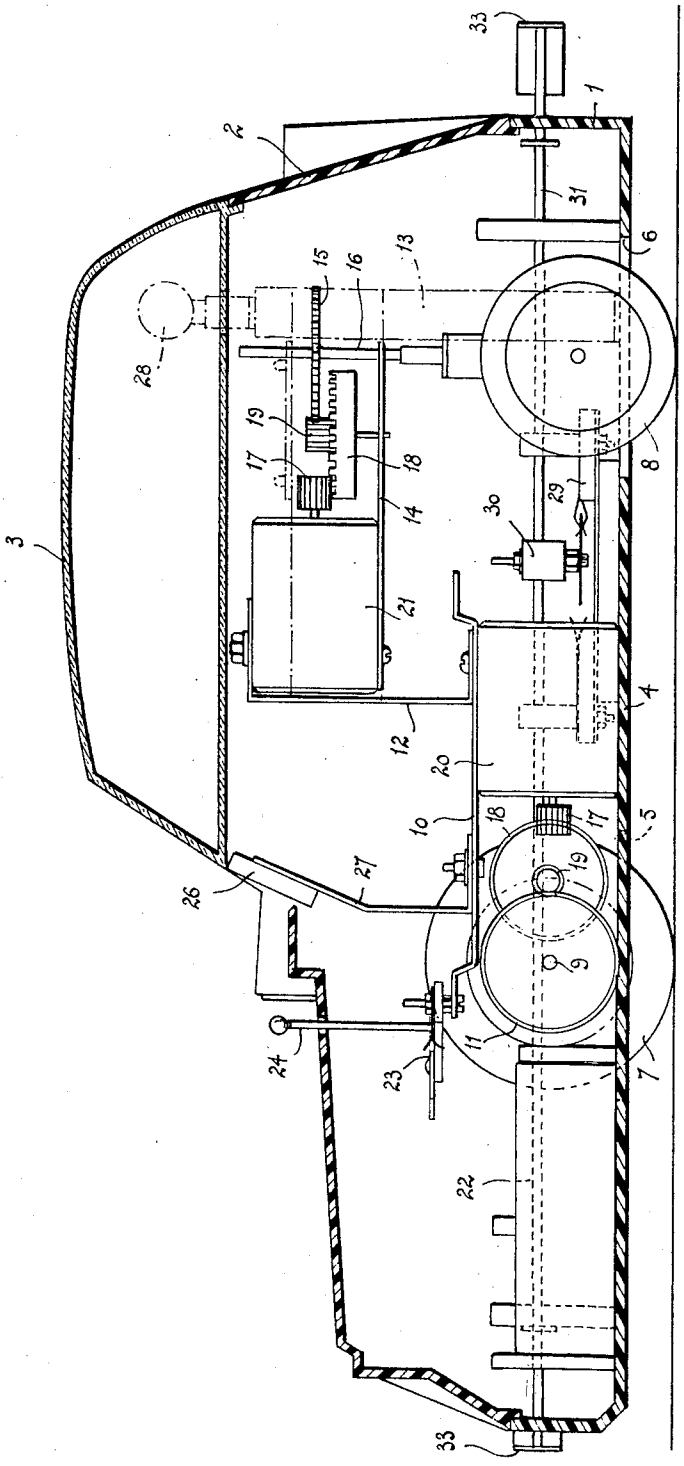


Fig. 1

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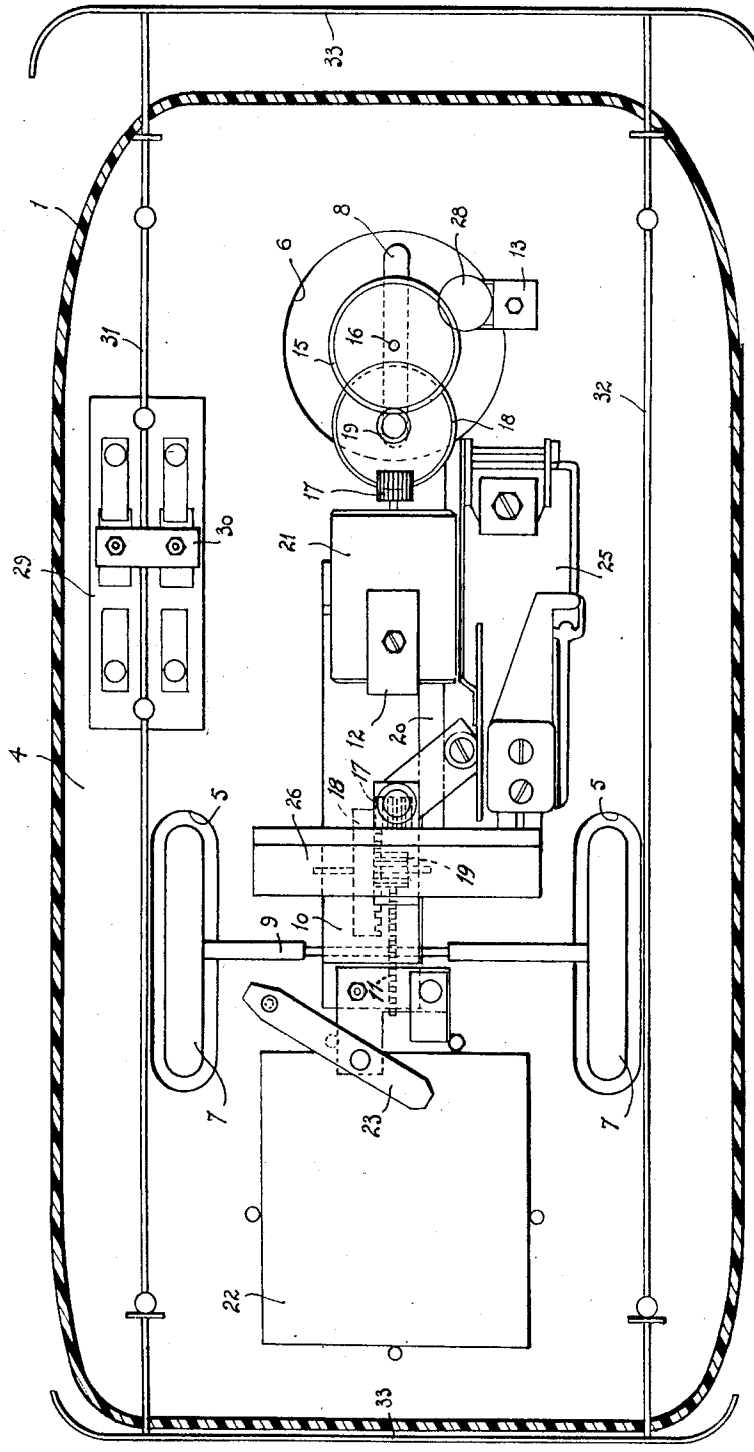


Fig. 2

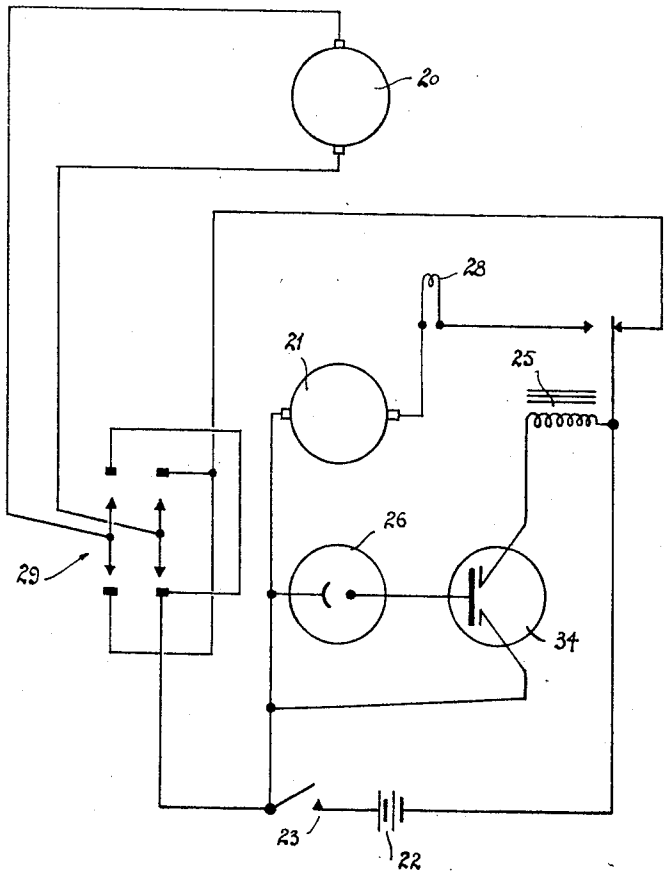
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Fig. 3



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2,921,408

TOY AUTOMOBILE CONTROLLABLE FROM A DISTANCE

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Application August 8, 1957, Serial No. 677,016

Claim priority, application France April 26, 1957

5 Claims. (Cl. 46—244)

My invention has for its object a toy automobile the movements of which are controlled from a distance, more particularly through the agency of a luminous beam. Said toy is driven electrically by a single supply of current, such as a dry cell or a storage battery feeding the propelling circuit and the steering circuit.

One of the main objects of the invention consists in the execution of an autonomous toy which is not connected with an outer feeding circuit and the movements of which are obtained through remote action.

My invention will be described hereinafter in accordance with a preferred embodiment given by way of example and illustrated in the accompanying drawings wherein:

Fig. 1 is a diagrammatic side view of the toy automobile, its body being shown sectionally.

Fig. 2 is a plan view of the mechanism carried by the chassis which latter is shown sectionally.

Fig. 3 is a wiring diagram.

The toy vehicle illustrated includes a chassis **1** and a body **2** which are both made of molded plastic material and which are assembled through interengagement for instance, so as to form a sort of case enclosing the mechanism of the vehicle. The upper section of the body may be provided with a transparent cap **3** so as to cover the seats of the driver and of the passengers and the imitation switch board instruments while allowing same to be seen by the child playing with the toy.

The mechanism of the vehicle is bolted over the flat bottom **4** of the chassis which is provided with openings **5** and **6** for the passage of the two wheels **7** on the driving axle and of a third wheel **8** forming the steering wheel. One of the two wheels **7** is loose while the other wheel **7** is secured to the common driving axle **9** to provide a differential effect, said axle revolving inside a casing **10** which is secured to the bottom **4** of the chassis and contains an electric motor and a speed reducing gear controlling the gear wheel **11** rigid with said axle. Above the casing are provided two uprights **12** and **13** rigidly secured, for instance, to said casing and to the bottom **4** of the chassis respectively and said uprights carry an upper casing **14** containing a further electric motor and speed reducing gear controlling a gear wheel **15** secured to the vertical pin **16** controlling the loose steering wheel **8**. The two electric groups constituted by an electric motor and a speed reducing gear may be identical: each motor spindle carries a pinion **17** meshing with a gear wheel the teeth of which project forwardly at **18** with reference to the body of the gear which is coaxially rigid with a pinion **19** meshing with the gear wheel **11** or **15** according as to whether the motor considered is the propelling motor **20** or the steering motor **21**. The two groups the axes of which are parallel are merely shifted angularly by 90° round their axis with reference to each other, the controlled gear wheels extending respectively vertically as shown at **11** and horizontally as shown at **15**.

At one end of the toy vehicle, the bottom of the chassis

is provided with a recess for a dry cell **22** serving as a supply of current for the feeding of the motors. A general switch **23** carried by the casing **10** may be actuated by a lever **24** projecting through a port provided in the body of the automobile. On the bottom **4** of the chassis and laterally thereof is housed a relay **25** provided for the switching of the supply of electric energy from the propelling motor **20** to the steering motor **21** under the control of a photo-cell **26** carried by a support **27** secured to the casing **10** and exposed to view through an opening in the chassis. An electric bulb **28** carried by the upright **13** and appearing to view underneath the cap **3** serves as a resistance for slowing down the steering motor **21**. The circuit feeding the propelling motor **20** includes a reversing switch **29** secured to the chassis and operating under the action of shocks. As illustrated, the movable contact pieces of said reversing switch may be secured to a transverse member **30** carried by a longitudinal bar **31** sliding longitudinally of the chassis and carrying together with a similar sliding bar **32** on the other side of the chassis a movable shock absorber **33** at either end of the toy vehicle. In a modification, the reversing switch may also be controlled through inertia.

The wiring diagram illustrated in Fig. 3 shows the supply of current **22** feeding through the agency of the main switch **23** two parallel branch circuits. One of said branch circuits includes a normally closed switch controlled by the relay **25**, the reversing switch **29** and the propelling motor **20** while the other branch circuit includes the normally open switch of said relay **25**, the resistant bulb **28** and the steering motor **21**. The winding controlling the relay **25** is inserted in a third branch circuit in parallel with the two first branch circuits and passing through a transistor **34** controlled by the photocell **26**.

When the general switch **23** is closed and the reversing switch **29** is in either of its operative positions, the propelling motor **20** is normally fed and drives the vehicle in either direction according to its direction of rotation as defined by the position of the reversing switch. If, during the progression of the vehicle, a luminous beam, produced for instance by a torch, is directed towards the cell **26**, the transistor **34** fed by the latter allows current to pass so that the winding of the relay **25** is energized and its armature is drawn in so as to switch the supply **22** of electrical energy off the propelling motor **20** onto the steering motor **21**. The first motor stops and the vehicle ceases being driven while the latter motor rocks the pin **16** so as to change the angular setting of the steering wheel **8** as long as the illumination lasts. As soon as the illumination is cut out, the steering motor **21** stops and the propelling motor **20** starts running again and causes the vehicle to run in the direction which has now been given to it by the steering wheel **18**. If, during its progression, the vehicle abuts against a hindrance, the reversing switch **29** is operated and changes the direction of rotation of the propelling motor **20** so that the vehicle stops and starts again immediately in the opposite direction.

It is thus apparent that, through the mere operation of a luminous beam, it is possible to control the movements of the vehicle which reacts in the presence of light after the manner of a cybernetic apparatus. The extreme simplicity of the arrangement provided both from an electrical and from a mechanical standpoint is also obvious.

What I claim is:

1. A remote-controlled automobile comprising a chassis, drive wheel means supported on said chassis, steering wheel means on said chassis, a driving motor operatively connected to said drive wheel means, a steering

motor operatively connected to said steering wheel means for steering rotation thereof, a single pole double-throw relay having a first contact connected with said driving motor and a second contact connected with said steering motor, a battery connected to the pole of said relay and to said contacts through said driving motor and said steering motor respectively, and means responsive to a signal for energizing said relay to cause said pole to contact one or the other of said contacts.

2. The automobile of claim 1, said last-mentioned means comprising a photoelectric cell.

3. The automobile of claim 1, and further comprising a front bumper and a rear bumper connected together for conjoint movement and slidably mounted with respect to said chassis, and a reversing switch operatively connected to said bumpers and in circuit with said driving motor for reversing the direction of rotation of said driving motor upon a change in the positions of said bumpers.

4. A remote-controlled automobile comprising a chassis, drive wheel means supported on said chassis, steering wheel means on said chassis, a driving motor operatively connected to said drive wheel means, a steering motor operatively connected to said steering wheel means for steering rotation thereof, a battery, switching means for operatively connecting said battery sequentially and successively to said two motors, and means responsive to a signal for actuating said last-mentioned means.

5. A remote-controlled automobile comprising a chassis, drive wheel means supported on said chassis, steering wheel means on said chassis, a driving motor operatively connected to said drive wheel means, a steering motor operatively connected to said steering wheel means for steering rotation thereof, a battery, switching means for operatively reciprocatively connecting said battery to said two motors, and means responsive to a signal for actuating said switching means.

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