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Perego

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[54] **ELECTRIC GEARSHIFT FOR CHILDREN'S CARS**

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[30] **Foreign Application Priority Data**

Jun. 29, 1990 [IT] Italy ..... 21423/90[U]

[51] **Int. Cl.**[5] **H01H 9/00**; H02P 1/08

[52] **U.S. Cl.** ..... **200/61.88**; 200/1 V; 318/139; 318/280

[58] **Field of Search** ..... 200/1 V, 61.85–61.91; 318/109, 139, 280

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Attorney, Agent, or Firm—McGlew and Tuttle

[57] **ABSTRACT**

An electric gearshift device (**10**) for an electric car for children has a lever (**12**) which can be operated manually to give different electrical connections between an electric motor and sets of batteries, so as to achieve different running conditions. In particular, the device (**10**) comprises a first two-speed electric selector switch (**16**) and a second electric reversing switch (**15**). The lever (**12**) is movable from a first to a second position to control the movement of the first switch (**16**), in the second position acting on the first switch (**16**) with elastically yieldable thrust surfaces (**24**) to enable the lever (**12**) to pass said second control position and reach a third position in which it actuates the second switch (**15**).

19 Claims, 3 Drawing Sheets

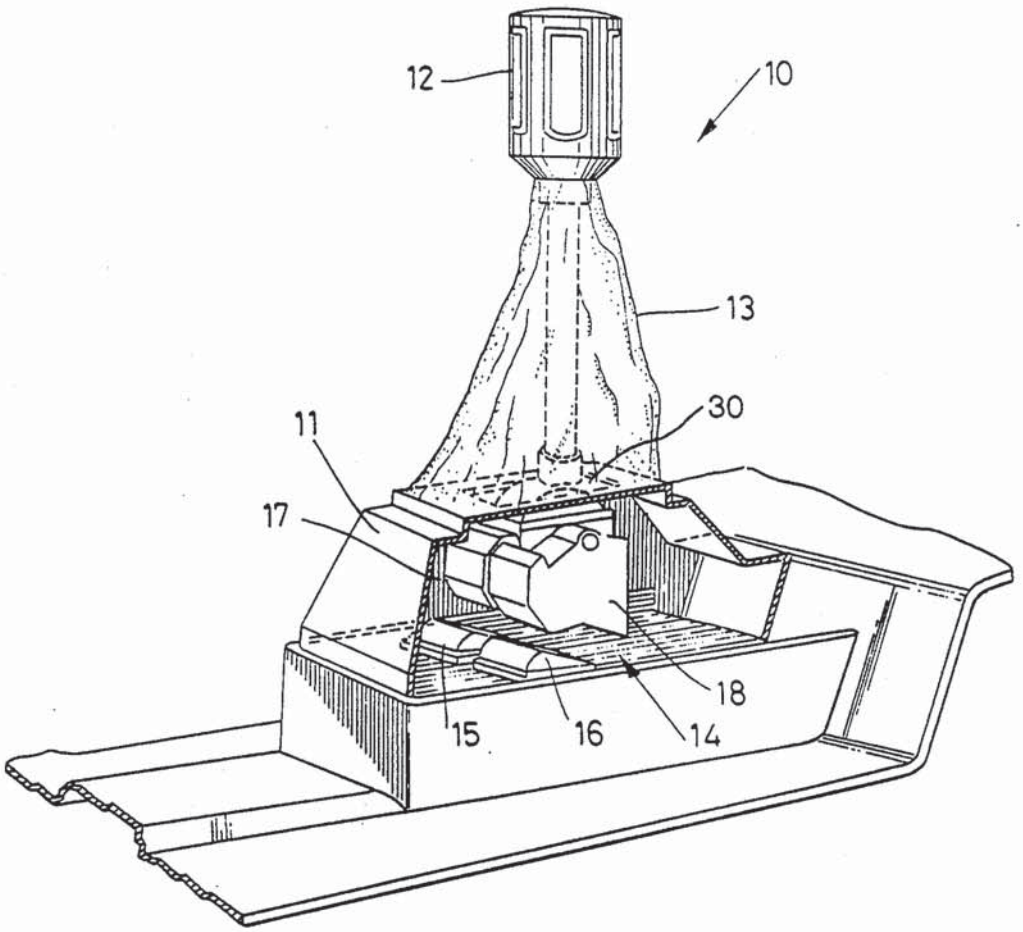


Fig. 1

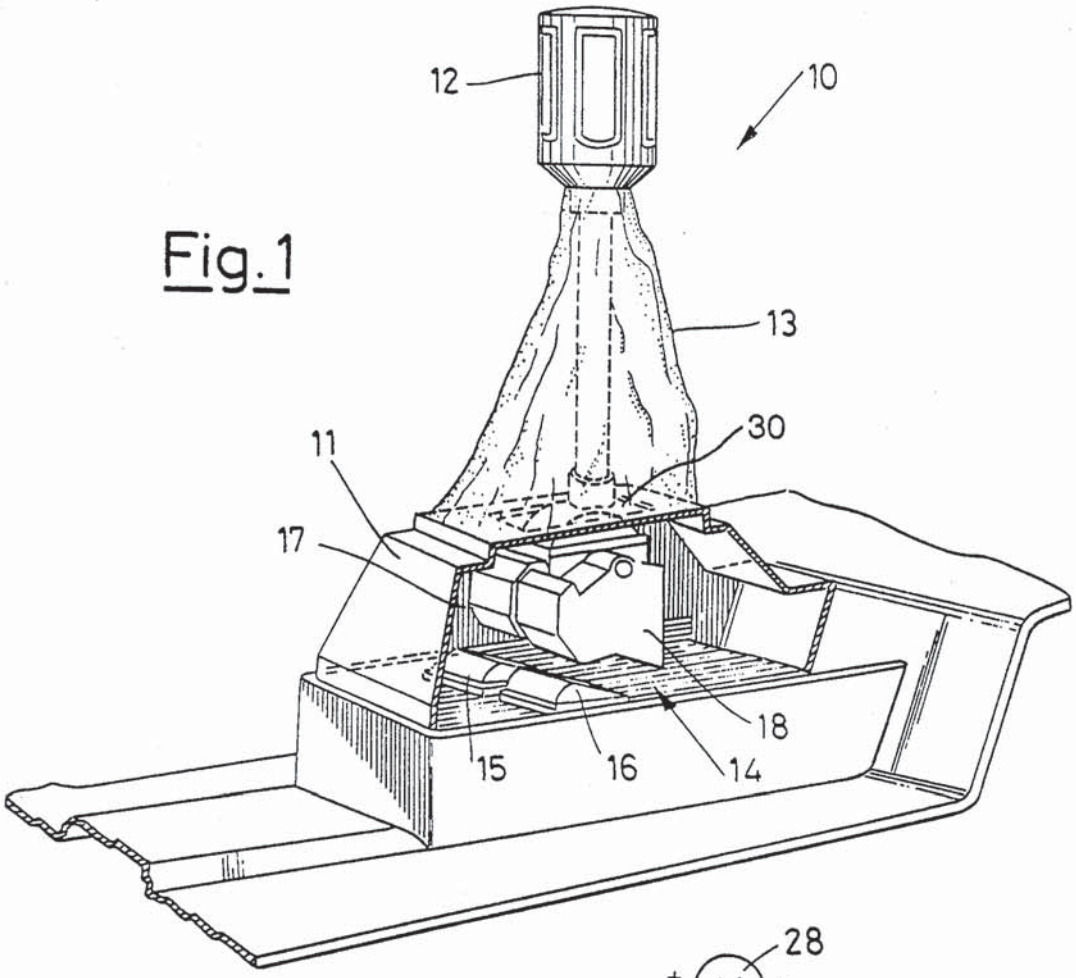
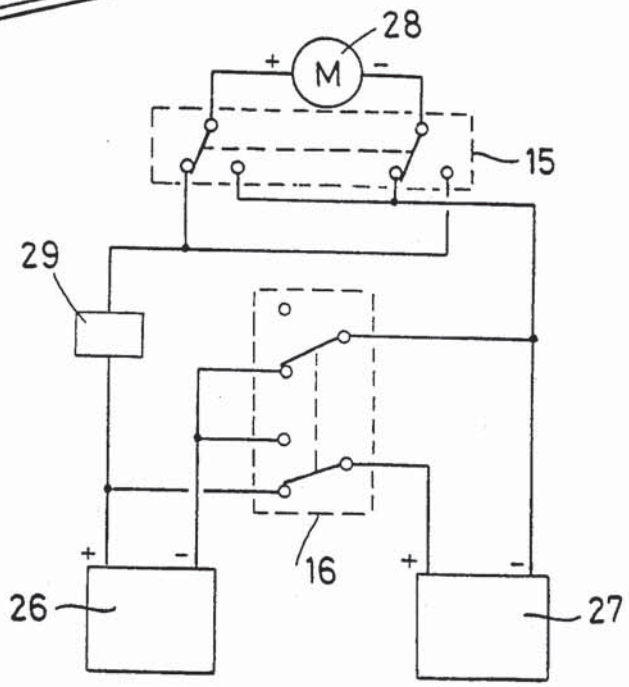


Fig. 6



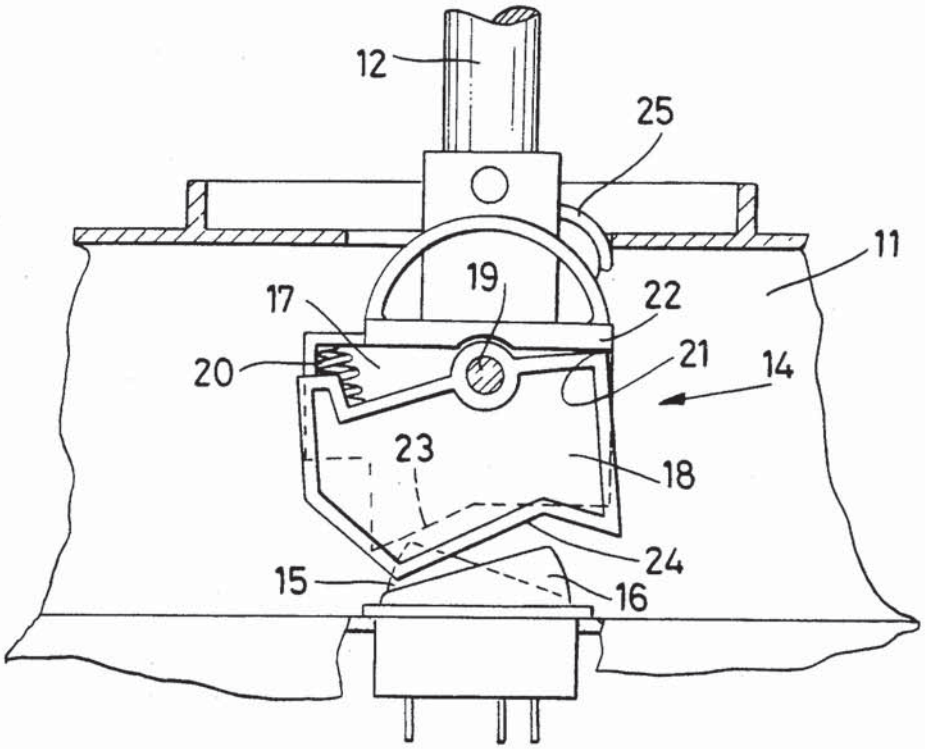


Fig. 2

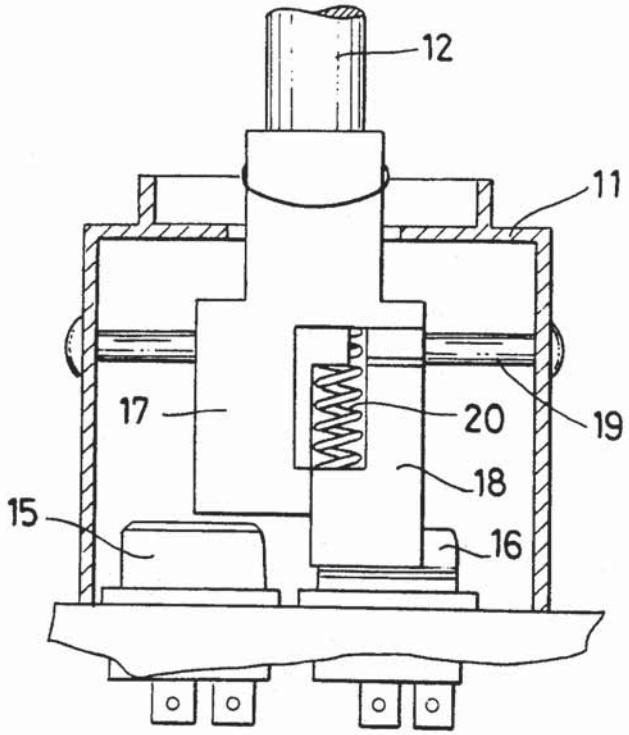


Fig. 3

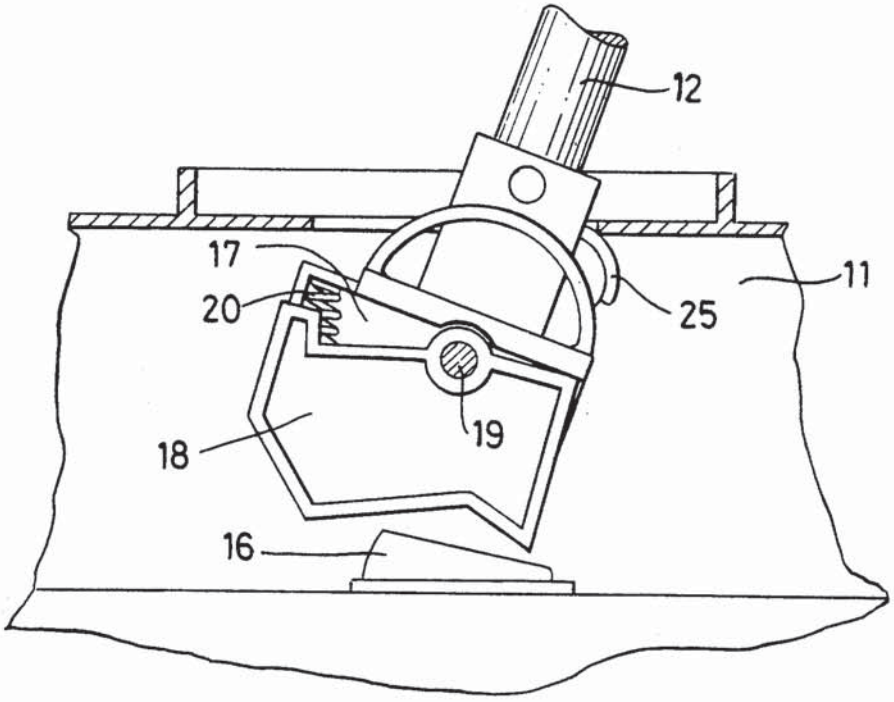
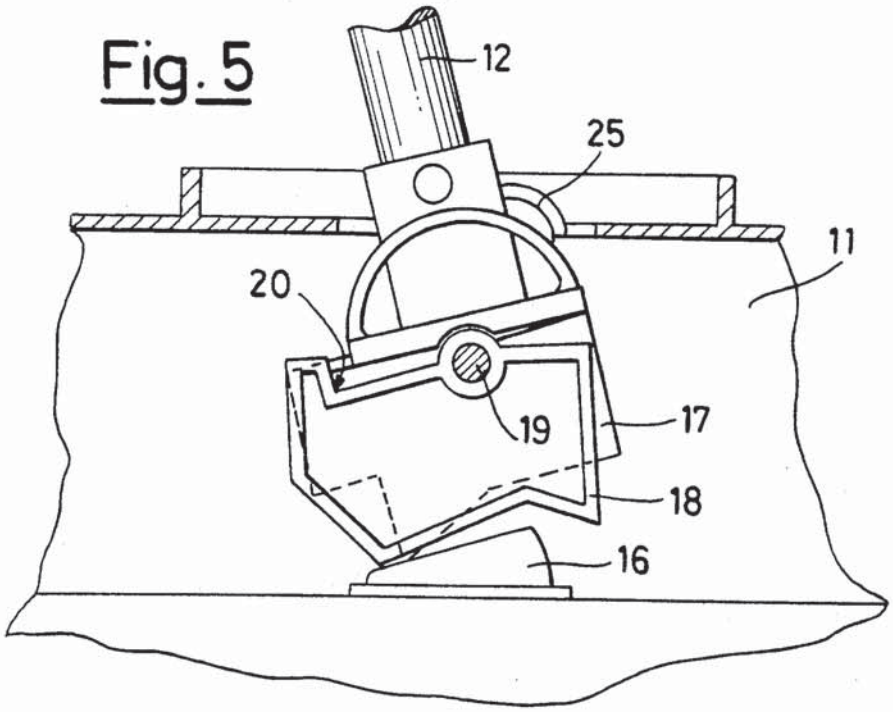


Fig. 4

Fig. 5



ELECTRIC GEARSHIFT FOR CHILDREN'S CARS

FIELD OF THE INVENTION

This invention refers to a gearshift suitable for electric cars for children.

BACKGROUND OF THE INVENTION

In the manufacture of such cars it is advantageous to provide an electric gearshift device by which it is possible to obtain two forward "speeds" and one reverse.

SUMMARY AND OBJECTS OF THE INVENTION

The general scope of this invention is to provide a gearshift which has the aforesaid features and is simple and economical to manufacture.

This scope is achieved, according to the invention, by providing an electric gearshift device **10** for an electric car for children, of the type which can be operated manually to provide different electrical connections between an electric motor and sets of batteries. These different electrical connections correspond to different running conditions, and are implemented by a first two-speed electric selector switch **16**, a second electric reversing switch **15** and a lever **12** which is movable from a first to a second position to control the movement of the first switch **16**. In the second position the lever **12** acts on the first switch **16** with elastically yieldable thrust surfaces **24** to enable the lever **12** to pass the second position in which it controls the first switch **16** and reach a third position in which it actuates the second switch **15**.

The innovatory principles of this invention and its advantages with respect to the known technique will be more clearly evident from the following description of a possible exemplificative and non-restrictive embodiment applying such principles.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. **1** shows a schematic perspective partial phantom view of an electric gearshift made according to this invention;

FIG. **2** shows a partial cross-sectional view of the gearshift of FIG. **1**;

FIG. **3** shows a cross-sectional view of the gearshift of FIG. **2**;

FIG. **4** shows a side view of the gearshift of FIG. **2** shifted to a different gear;

FIG. **5** shows a side view of the gearshift of FIG. **2** shifted to reverse;

FIG. **6** shows an example of a basic wiring diagram for use of the gearshift described herein.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the Figures, a gearshift, made according to the invention and generally indicated by reference **10**, comprises a box-shaped casing **11**, secured to the electric car. From the top of the casing **11**, protrudes a control lever **12**, covered, if necessary, with a flexible sheath **13** (for example, made of rubber).

The lever **12** is connected from below to an actuating element **14** which controls electric switches **15** and **16**. As can be more clearly seen in FIGS. **2** and **3**, the actuating element **14** comprises a first or fixed portion **17**, integral with the lever **12** and pivoted to the walls of the box **11** by means of a pivot or shaft **19** on which is rotatingly disposed a second or yield portion **18**.

Disposed between the two portions **17** and **18** is a thrust spring **20**. The portion **18** has a corner **21** at the end opposite that of the pivot or shaft which strikes against a protrusion **22** on the portion **17**.

As can also be clearly seen in FIG. **2**, the lower part of the portion **17** comprises slating surfaces **23** and the portion **18** comprises slanting surfaces **24** for respectively operating switches **15** and **16** of the rocker type normally operated by hand. In particular, the switch **16** is of the type with two fixed positions, while the switch **15** is of the pushbutton or momentary type, that is to say, with only one fixed position (the one shown in FIG. **2**).

The upper part of the element **17** has a curved sliding surface **25** which frictionally slides on the edge of the aperture **30** and through which the lever **12** passes through the casing **11**. When used, the lever can be shifted to and from the extreme positions shown in FIGS. **4** and **5**.

The forward or first position (or turned in a clockwise direction as shown in FIG. **4**) is stably balanced thanks to the engagement of the surface **25** with the edge of the casing **11**. During the movement to reach the forward or first position the element **18** is pushed by contact with element **17** so that the slanting surface **24** operate the switch **16** to shift it to its other position. The surfaces **23** on the contrary do not come into contact or interfere with the switch **15** during the movement to the forward or first positions as shown in FIG. **4**.

When shifting from the forward or first position, in the opposite direction to the second or central position of lever **12** as shown in FIG. **2**, the slanting surface **24** return the switch **16** to its original or second position (FIG. **2**). For this purpose the force of the spring **20** must be grater than the force necessary to switch the switch.

When the lever is shifted towards the reverse or third position (or in an anticlockwise direction as shown in FIG. **5**) the spring **20** compresses due to the impossibility of the element **18** to rotate further since it strikes against the switch **16**. Therefore, switch **16** remains in its original or second position during movement of lever **12** in the third position as shown in FIGS. **2** and **5**. The lower surfaces **23** of the lent **17** simultaneously press the switch **15** as shown in FIG. **5**. This third position is not stably balanced. When the lever **12** is released, the thrust of the spring **20** returns the device to the central or second position shown in FIG. **2** and the switch **15** snaps back to its only stably balanced position.

FIG. **6** shows a possible exemplificative electrical connection of the gearshift of this invention. The switches **15** and **16** used in the example are of the type with two switching contacts, and are connected, as shown, to interconnect two electric batteries **26** and **27** to an electric motor **28** to drive the car. The circuit also comprises a device **29** for controlling the speed of rotation of the motor. This device **29** can be of any known type, for example electronic, as is well known by the technician, and can be controlled, for example, by a pedal disposed in a position similar to that of the accelerator pedal of a normal car.

As can be seen in the wiring diagram (where the switches are in the positions corresponding to FIG. **2**), the two batteries (for example 6V) are connected, by means of the switch **16**, in parallel with each other. In

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