

May 10, 1960

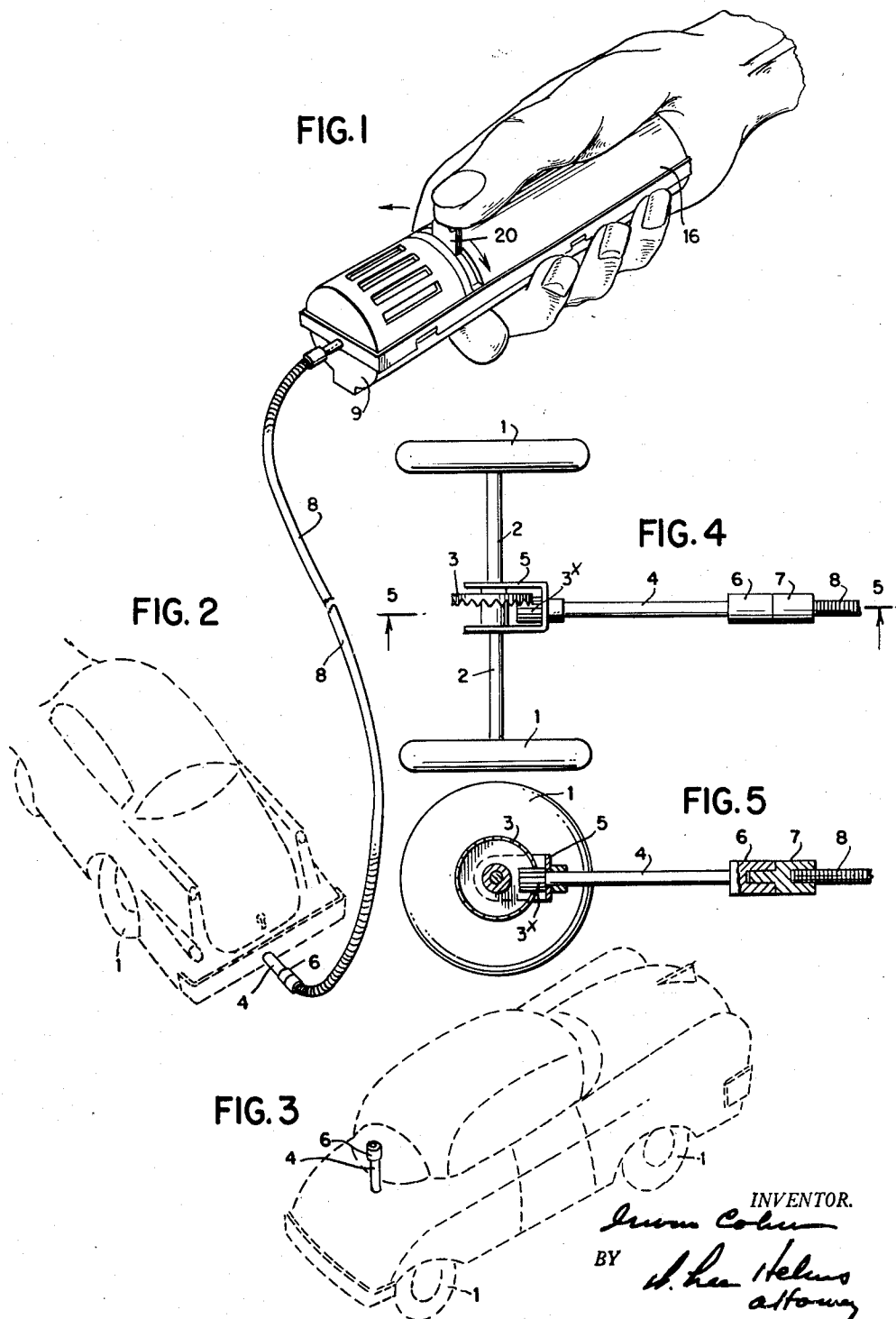
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2,936,386

MOTOR DRIVE FOR WHEELED TOYS

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2 Sheets-Sheet 1



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2 Sheets-Sheet 2

FIG. 6

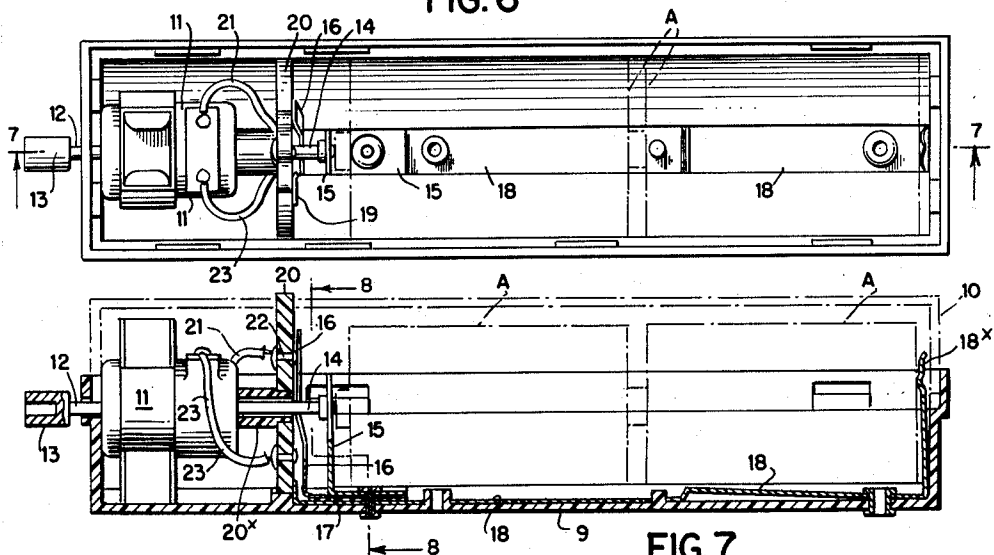


FIG. 7

FIG. 10

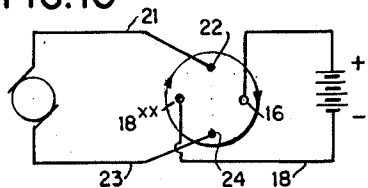


FIG. 9

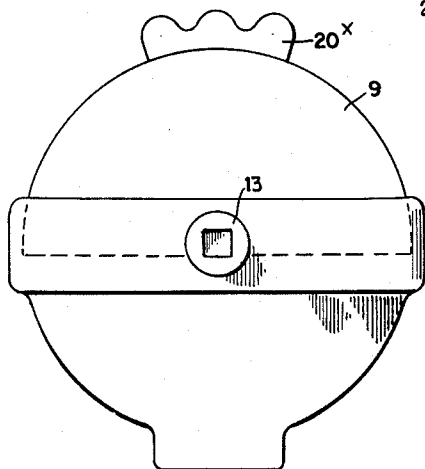
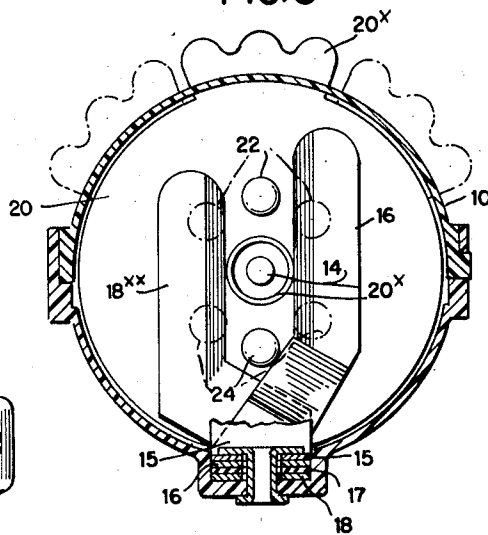


FIG. 8



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1

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MOTOR DRIVE FOR WHEELED TOYS

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1 Claim. (Cl. 310—50)

The object of the present invention is to provide means for attachment, by simple and convenient means, of a driving and control, in the form of a handle, for each of a plurality of wheeled toys, the handle containing an electric battery assembly and a switch which controls an electric motor leading to a flexible member for connection to the gear drive of the wheeled toy. By means of the switch the motor can be reversed so that the toy may be controlled to back up and avoid objects on a floor or other surface upon which the toy operates, and the flexible drive member may be so connected to the toy that the operator may cause the latter to deviate from straight lines of movement, etc. Thus the same drive and control may be used with a variety of wheeled toys each having a gear drive to which the flexible member may be quickly attached.

The invention will be described with reference to the accompanying drawings, in which:

Fig. 1 is a schematic view, partly in dotted lines showing the method of handling the handle-control.

Fig. 2 is a continuation of Fig. 1, showing by dotted lines one form of wheeled toy and the flexible member connected thereto.

Fig. 3 is a view in dotted lines showing the wheeled toy drive shaft extending outwardly in vertical direction.

Fig. 4 shows the top plan view of the wheeled toy drive shaft and gearing to the axle, together with a drive joint for the flexible driving member.

Fig. 5 is an elevation view of the wheeled toy drive shaft and gearing to the axle, together with a drive joint for the flexible driving member.

Fig. 6 is a top plan view of the control handle, with its cover removed.

Fig. 7 is a vertical section taken on the line 7—7, Fig. 6, showing the cover in dotted lines.

Fig. 8 is a vertical section taken on the line 8—8, Fig. 7, looking in the direction of the arrows, partly dotted.

Fig. 9 is a vertical view or elevation showing the drive end of the handle control, i.e. the control handle.

Fig. 10 is wiring diagram associated with the present invention.

Referring to Figs. 1 to 4 inclusive, I have shown the motor drive as connected to either a horizontal or a vertically directed drive shaft for a wheeled toy, in this case a toy automobile. As shown in Fig. 4 a rear axle shaft carrying the wheels 1, the shaft being indicated at 2, may also carry a gear 3, engaged by the pinion 3^x on drive shaft 4 which is held in position by a swivel-yoke 5 on axle 2. Drive shaft 4 carries at its end a member 6 adapted to be releasably connected with a drive element 7 on flexible shaft 8. The connection between members 6 and 7 can be of any form quickly releasable. In the form shown, member 6 will have an out-of-round hole to frictionally receive a nose carried by member 7.

With reference to the toy automobile shown in Figs. 2 and 3, it will be noted that the drive shaft 4 may be

2

positioned horizontally, or it may be swung up vertically or at an angle by means of yoke 5 and to the position of Fig. 3. Flexible connector 8 leads to the control handle 9, the latter having a cover 10, the latter being removable.

In control handle 9, and at its front end, is an electric motor 11 which drives a motor shaft 12 on which is an exposed connector 13, of any suitable type for the flexible connector 8 which is hereinafter termed the drive cable.

Motor 11 is of the reversing type and it receives current from two dry cells A indicated by dotted line in Figs. 6 and 7. The front end of the motor casing is apertured to receive a holding pin 14 carried by and pressed inwardly by a bent spring plate 15 having a horizontal base. Under said base is the horizontal lower end of a switch finger 16 in front of spring plate 15. Both of these members are insulated by insulation member 17, Fig. 8, from a current return strip 18 which leads to a spring battery contact 18^x at the rear end of case 9 and to a switch finger 18^{xx}, Fig. 8.

At 20 is a switch disk which has a thumb portion 20^x projected through a transverse slot in the case cover 10. The switch disk has a sleeve 20^x which receives pin 14 and it can oscillate to the right and left about the pin as an axis. Wire lead 21 to the motor is connected to a contact stud 22 carried by the switch disk and headed on its rear side. Wire lead 23 to the motor is connected to a contact stud 24 carried by the switch disk and headed on its rear side.

Referring to the wiring diagram, Fig. 10, when the switch disk is moved to bring its contact stud 22 into engagement with positive contact finger 16, and its contact stud 24 into engagement with negative contact finger 18^{xx} current will flow into lead wire 21 hence to that pole of the motor, say for clockwise rotation, and will return via wire 23 and return strip 18. When the switch disk is moved to bring its contact stud 24 into engagement with positive contact finger 16, and, its contact stud 22 into engagement with negative contact finger 18^{xx}, current will flow into lead wire 23 for reverse action of the motor, and the current return will be via wire 21, contact finger 18^{xx}, and return strip 18.

By means of the invention many types of wheeled toys may be successively driven forwardly, reversed, and guided simply by providing a driving gear on an axle, and a simple swiveled drive shaft and pinion, the shaft being projected outwardly in any inclination and ready for holding by the flexible connector. In fact, this "holding" may be by means of a short piece of rubber tubing or by a little sleeve at the end of the connector, the latter and the shaft being apertured to receive a friction-stud. These factors will be understood without necessity of further description.

Having described my invention, what I claim and desire to secure by Letters Patent is as follows:

A motor drive for toy wheeled vehicles consisting of an elongated hollow casing, a reversing motor within the casing at one end thereof, a shaft projecting from the motor outwardly of the casing and coaxially therewith and adapted to receive a flexible drive member for a toy wheeled vehicle, a holding pin carried by the rear end of the motor, a bent spring plate carried internally of the casing and pressing upon said holding pin, a switch carrying disk rotatable about said holding pin and having a finger engaging portion projected through a slot in the wall of the casing, a contact stud carried by the switch disk, and a flexible wire connecting said stud to one pole of the reversible motor, a second contact stud carried by the switch disk and leading to a second pole of the motor, spaced contact fingers carried by the casing and projecting inwardly thereof in the

path of oscillation movements of the contact disk whereby the contact studs may be brought selectively into engagement with one or the other contact fingers, a current return strip within the casing and lying under said contact fingers, thence extending rearwardly and having an inwardly bent battery contact extension near the rear wall of the casing and electrically connected to one of said switch fingers, a positive electrical connection adapted for contact with a battery within the casing and leading to a second one of the spring fingers, and means securing the lower ends of the fingers in superimposed position to an inner wall of the casing, said securing

means including insulation, as and for the purpose set forth.

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