

May 5, 1925.

1,536,329

L. CARUSO

BRUSH RIGGING

Filed June 9, 1923

2 Sheets-Sheet 1

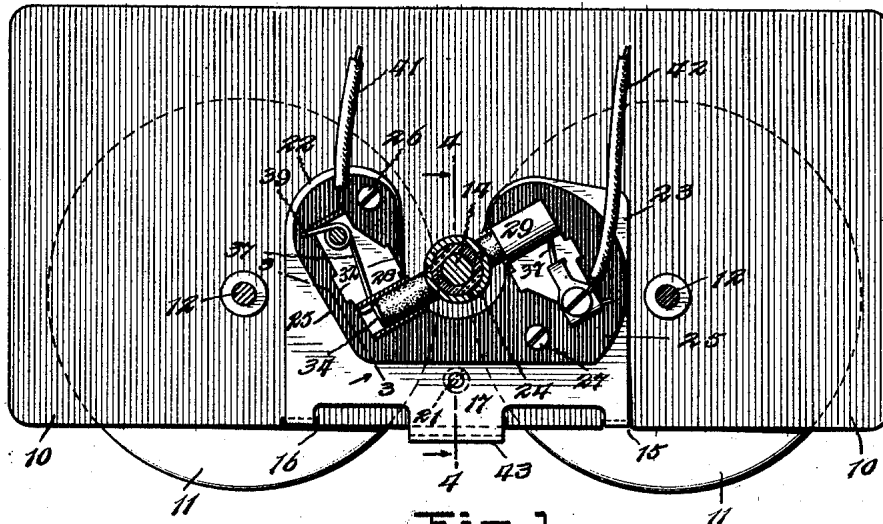


Fig. 1.

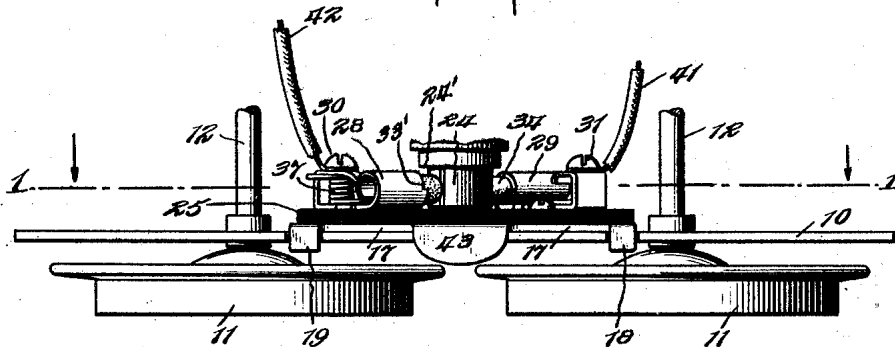


Fig. 2.

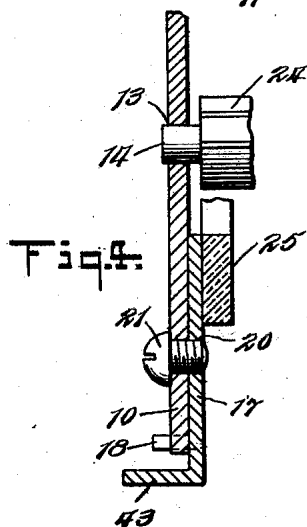


Fig. 4.

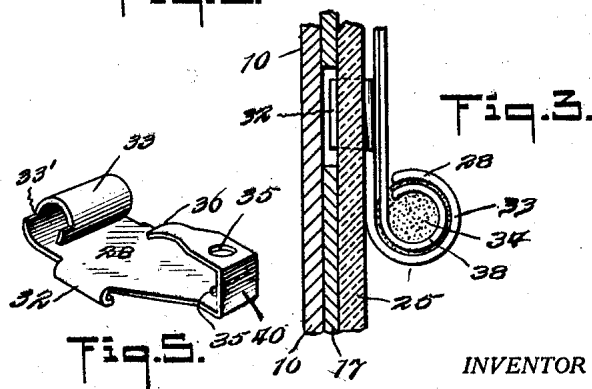


Fig. 3.

Fig. 5.

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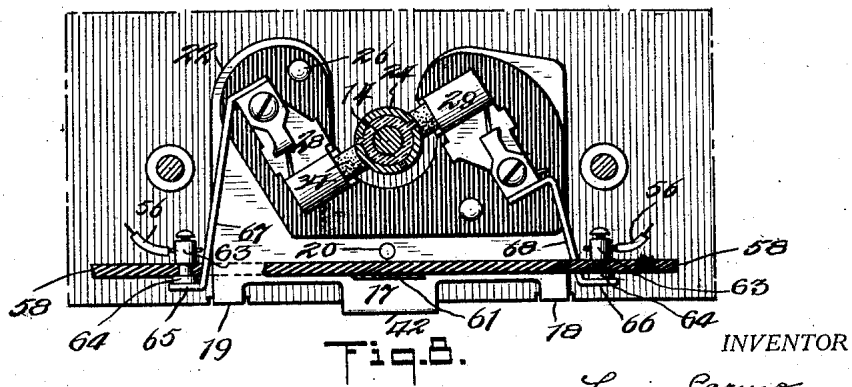
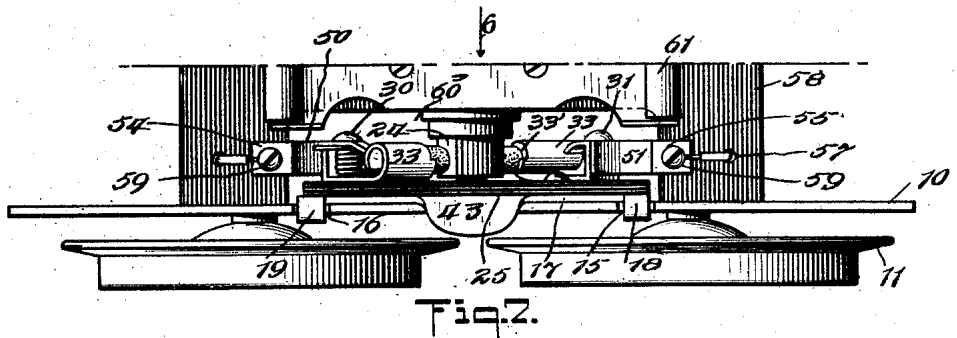
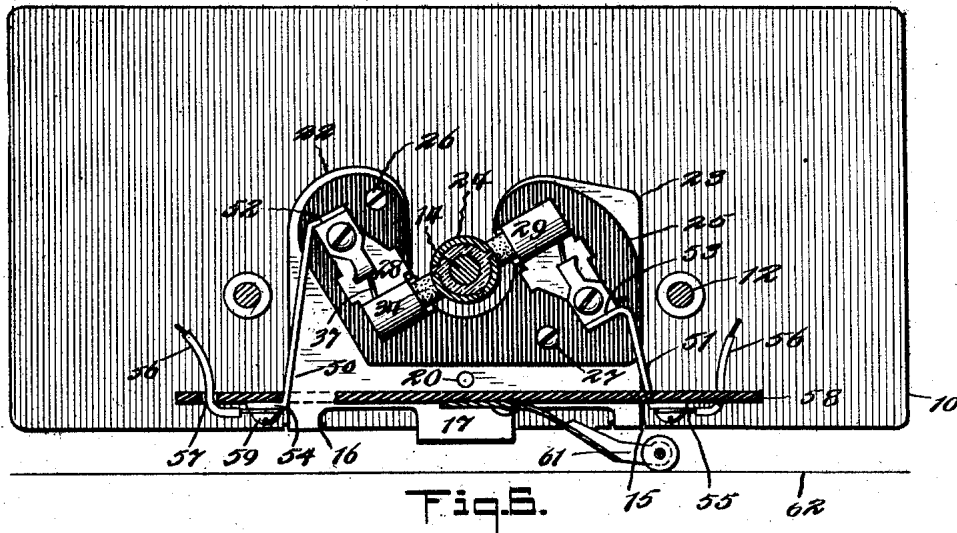
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

LOUIS CARUSO, OF IRVINGTON, NEW JERSEY, ASSIGNOR TO THE LIONEL CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

BRUSH RIGGING.

Application filed June 9, 1923. Serial No. 644,374.

To all whom it may concern:

Be it known that I, LOUIS CARUSO, a citizen of the United States, and a resident of Irvington, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Brush Rigging, of which the following is a specification.

The present invention relates to brush rigging and more particularly to a device for holding the brushes in toy electrical devices.

In manufacturing toy motors it is desirable to provide suitable brush rigging which is capable of easy disassembly for purposes of repairs, and for replacement of the brushes. In certain types of these motors, such as those designed for use in toy electric trains it is desirable to arrange the brush rigging so that it can readily be removed without the necessity of taking down the car or locomotive of which it forms a part. The embodiments of the invention to be described in the present application have been developed more particularly for use with a toy electric locomotive or car.

Objects of the present invention are to provide a substantial brush rigging for the above purposes which will be capable of easy removal for inspection and repairs, and one which may be made in large quantities in an inexpensive manner so that all parts may be easily interchangeable.

Another object of the invention is to provide a brush rigging in which the brushes and supporting devices may be assembled as a unit and then this unit readily fastened in place alongside the commutator with which the brushes are to co-operate.

In the accompanying drawings there is shown for purposes of illustration one of the many possible embodiments in which the present invention may take form, together with modifications of certain parts, it being understood that the drawings are to be considered as illustrating the invention rather than limiting the same. In these drawings:

Fig. 1 is a sectional view taken on the line 1—1 of Fig. 2 showing an arrangement of brush rigging suitable for use in a toy electric vehicle,

Fig. 2 is a an elevational view of the structure shown in Fig. 1 taken from underneath the vehicle,

Fig. 3 is a section taken on the line 3—3

of Fig. 1 looking in the directions of the arrows,

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 1 looking in the direction of the arrows,

Fig. 5 is a perspective view of a form of brush holder,

Fig. 6 is a view similar to Fig. 1, taken in the direction of the arrow 6 of Fig. 7, and showing a modified form of brush lead connection,

Fig. 7 is an elevational view of the structure shown in Fig. 6 taken from underneath the vehicle, and

Fig. 8 illustrates a further modification.

Referring now to the Figs. 1 to 5 of the drawings, the side frame member of the toy vehicle is shown at 10 in the form of a flat piece of sheet metal. This frame member carries the running gear here shown in the form of flanged wheels 11, 11 mounted on shafts, 12, 12. It is of course understood that the other side of the vehicle is provided with a somewhat similar frame member. The frame member 10 is also provided with a hole 13 adapted to act as a bearing for the armature shaft 14 and with notches 15 and 16 for purpose to be described. A flat sheet metal plate 17 is provided with projections 18 and 19 which are adapted to fit into the notches 15 and 16 in the frame member. The plate 17 is also provided with a threaded aperture 20 to receive a screw 21 which is passed through the frame member 10 from the outside as indicated in Fig. 4 and, in dotted lines, in Fig. 1. The screw and the lugs and notches co-operate to removably fasten the plate in place on the side frame.

The plate 17 extends up above the armature shaft 14 as indicated in Fig. 1, at 22 and 23. The metal between the upper portions 22 and 23 of this plate has been removed in order to provide an open slot which extends all the way to the upper edge of the plate, the slot being made wider than the commutator shown at 24.

A sheet of insulation 25 is fastened to the sheet metal plate 17 by means of screws 26 and 27 and this sheet of insulation, as is apparent in the drawings, has two portions which extend upwardly past the armature shaft. These upwardly extending portions are also separated in a manner similar to the parts 22 and 23 of the plate 17. Sheet

metal brush holders 28 and 29 are fastened to the insulating sheet by means of screws 30 and 31, and prongs 32 passed through the insulation and bent over as shown in Fig. 3.

5 These brush holders may be of any convenient form but are here shown as made of a piece of sheet metal by suitably cutting and folding the same. In addition to the prongs 32 above mentioned these brush holders are
10 provided with brush boxes 33 adapted to contain brushes 34, and with screw receiving apertures 35 adapted to receive the screws 30 and 31. A prong 36 is located in a position to hold the brush spring when
15 the brush is out of the box. The brush boxes 33 are cut away as indicated at 33' so as to effectively clear the shoulder 24' on the armature and permit the brush to cover practically the entire length of the commu-
20 tator segment. The screws 30 and 31 in addition to fastening the brush holders to the insulation, each serve as a retainer for a spring 37 one end 38 of which engages the brush to urge it toward the commutator
25 while the other end 39 is anchored against the upright portion 40 of the brush holder. As shown in Figs. 1 and 2, armature leads 41 and 42 may be connected to the screws 31 and 30.

30 The plate 17 and insulating sheet 25 with brush holders attached make up an assembled unit which may be readily put into the machine. It is only necessary to slide this made up unit upwardly from the bot-
35 tom of the car, bring the notches and projections in alignment and fasten the parts to the car by means of the screw 21. The leads are then connected in place and the brushes inserted.

40 When inspection is desired, or the boy using the car wants to satisfy his natural curiosity, it is merely necessary to disconnect the armature leads, take out the screw 21 and slide the parts down away from the
45 commutator. The springs 37 may be placed on the prongs 36 to prevent losing the brushes by the springs throwing them away. It is, of course, obvious that the open slot in the upper part of the sheet metal plate and the insulating sheet permit the with-
50 drawal of the parts downwardly. In order to assist one in handling the parts there may be provided if desired a finger grip 43 which projects outwardly from the bottom of the
55 frame member 10.

The structure shown in Figs. 6 and 7 is, in general, the same as that of Figs. 1 to 5, and corresponding reference characters are used for the corresponding parts. Instead
60 of leads in the form of wires fastened to the brush holders, there are here shown leads or connectors in the form of bent pieces 50 and 51 of sheet metal. These connectors are preferably soldered to the brush holders
65 at 52 and 53, and are provided with out-

wardly bent ends 54 and 55. The leads 56 for the armature circuit are passed through holes 57 in a block of insulation 58 and are fastened to the bent ends 54 and 55 by screws
70 59 threaded into the insulation. The insulating block is mounted on the locomotive in any convenient manner, and is cut away as shown at 60 to provide space for insert-
75 ing or removing the plate 17 and parts carried thereby. As here shown, the block 58 also carries the current collecting devices 61 adapted to make contact with a third rail 62. To remove this form of brush rig-
80 ging the screws 59 and 21 are removed, and the plate slid out of place.

The structure of Fig. 8 differs from that of Figs. 6 and 7 in that the block of insu-
85 lation 58 is provided with permanent binding posts 63 for the leads, and in that these binding posts have exposed contact surfaces 64 to contact with the bent ends 65 and 66
90 of the leads or connectors 67 and 68. This form of brush rigging may be removed bodily upon removal of the screw 21.

I claim:

95 1. A brush rigging comprising a sheet metal plate, a sheet of insulation fastened to the plate, and a pair of independent brush holders fastened to the insulation, said
100 sheet and plate having an open slot between the brush holders whereby the sheet and plate may be withdrawn as a unit, the brush holders being so disposed that brushes mounted therein may bear on opposite parts
105 of a commutator which is carried in the slot.

110 2. A brush rigging comprising a sheet metal plate, a sheet of insulation fastened to the plate, a pair of independent brush holders fastened to the insulation, arma-
115 ture leads adjacent the plate, and connectors, one end of the connectors being permanently united to the brush holders, and the other end connectible to the armature leads, said sheet and plate having an open
120 slot between the brush holders whereby the sheet, plate and connectors may be withdrawn as a unit, the brush holders being so disposed that brushes mounted therein may bear on opposite parts of a commutator
125 which is carried in the slot.

130 3. A brush rigging for toy vehicles having a connector, comprising, a sheet metal plate, a sheet of insulation fastened to the plate, and a pair of independent brush holders fastened to the insulation, said sheet and
135 plate having an open slot between the brush holders whereby the sheet and plate may be withdrawn as a unit, the brush holders being so disposed that brushes mounted there-
140 in may bear on opposite sides of a commutator which is carried in the slot.

145 4. A brush rigging for toy electric vehicles comprising, a flat member for supporting the running gear of the vehicle and the armature shaft of a motor, a sheet metal
150

plate, devices for removably fastening the plate to the flat member, a sheet of insulation fastened to the plate, and a pair of brush holders fastened to the insulation, said sheet and plate having an open slot between the brush holders whereby, when the fastening devices are removed, the sheet and plate may be removed as a unit past the armature shaft.

5. A brush rigging for toy electric vehicles comprising, a flat member for supporting the running gear of the vehicle and the armature shaft of a motor, a sheet metal plate, devices for removably fastening the plate to the flat member, a sheet of insulation fastened to the plate, a pair of brush holders fastened to the insulation, armature leads adjacent the plate, and connectors, one end of the connectors being permanently united to the brush holders, and the other end connectible to the armature leads, said sheet or plate having an open slot between the brush holders whereby, when the fastening devices are removed, the sheet and plate may be removed as a unit past the armature shaft.

6. In a toy electric vehicle, a flat side frame member, an armature shaft passing through the side frame, a sheet metal plate, means for removably fastening the plate to the frame member, a sheet of insulation fastened to the plate, and a pair of brush holders fastened to the insulation, said sheet and plate having an open slot between the brush holders whereby when the fastening devices are removed, the sheet and plate may be removed as a unit past the armature shaft.

7. In a toy electric vehicle, a flat side frame member, an armature shaft passing through the side frame, a sheet metal plate, means for removably fastening the plate to the frame member, a sheet of insulation fastened to the plate, a pair of brush holders fastened to the insulation, armature leads adjacent the plate, and connectors, one end of the connectors being permanently united to the brush holders, and the other end connectible to the armature leads, said sheet and plate having an open slot between the brush holders whereby, when the fastening devices are removed, the sheet and plate may be removed as a unit past the armature shaft.

8. A brush rigging comprising a sheet metal plate, a sheet of insulation fastened to the plate, a pair of brush holders fastened to the insulation, said sheet and plate having an open slot between the brush holders whereby the sheet and plate may be withdrawn as a unit, an insulating support having a cutaway portion to permit the removal of the sheet and plate, contacts carried by the insulating support, and connectors car-

ried by the brush holders and engagable with the contacts.

9. In a brush rigging, a plate having a slot opening toward one edge of the plate, and projections adapted to co-operate with notches on a fixed member for aligning the plate.

10. In a brush rigging, an insulating sheet having slot opening toward one edge thereof, and a pair of independent brush holders fixedly fastened to the insulating sheet and having brush boxes so disposed on opposite sides of the slots that brushes mounted therein may bear on opposite parts of a commutator which is carried in the slot.

11. In a brush rigging, an insulating sheet having slot opening toward one edge thereof, a pair of brush holders fastened to the insulating sheet, the brushes being disposed on opposite sides of the slot, a plate having a slot opening toward one edge of the plate, and projections adapted to co-operate with notches on a fixed member for aligning the plate.

12. In an electrical toy, a flat side frame member provided with notches along one edge, a plate fastened to the side of the frame member, said plate having projections fitting the notches, and a pair of brush holders insulatively carried by the plate.

13. In an electrical toy, a flat side frame member provided with notches along one edge, a plate fastened to the side of the frame member, said plate having projections fitting the notches, a pair of brush holders insulatively carried by the plate, and an insulating member carried adjacent the side frame member, and having a notch through which the plate and brush holders may be withdrawn.

14. In an electric motor, a brush rigging having two brush boxes in line with one another and adapted to hold brushes against the opposite sides of a cylindrical commutator, said rigging being removable as a unit in a lateral direction away from the armature shaft, fixed terminals, and connectors fixedly supported from the brush-boxes and cooperable with the terminals when the brush rigging is in position and separable when the brush rigging is removed.

15. A brush rigging bodily removable as a unit in a lateral direction away from the armature shaft, said rigging being provided with a pair of brush lead connectors bodily movable therewith whereby the removal of the rigging may electrically disconnect the same.

Signed at Irvington in the county of Essex and State of New Jersey, this 7 day of June, 1923.

LOUIS CARUSO.