

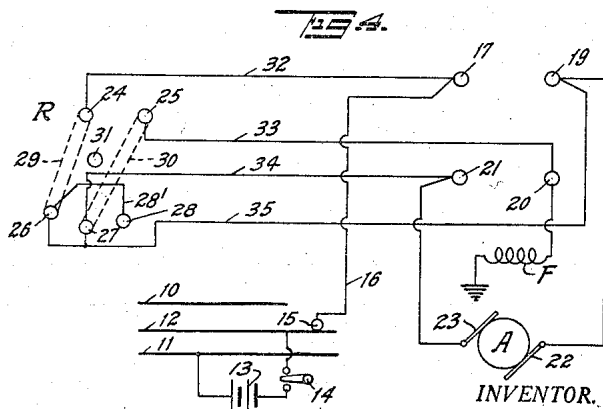
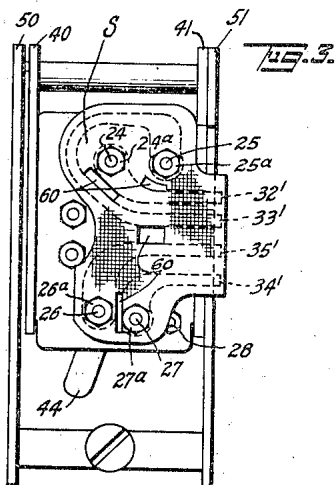
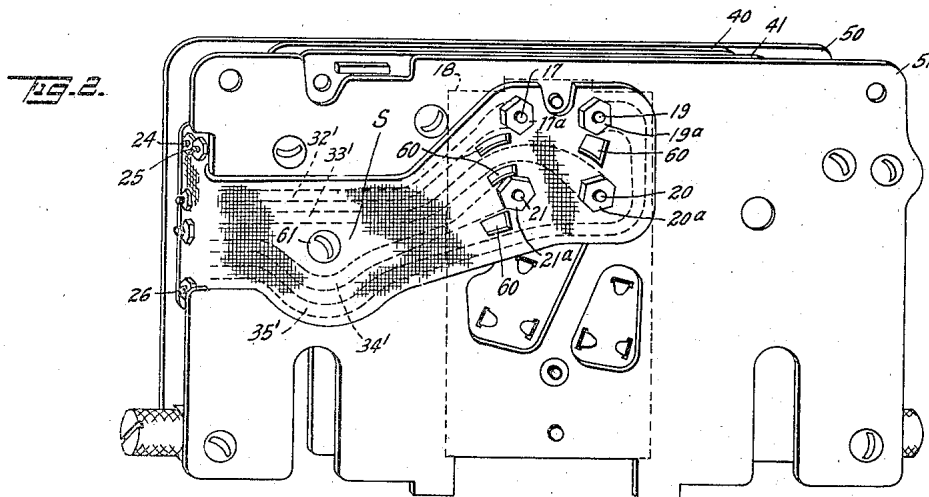
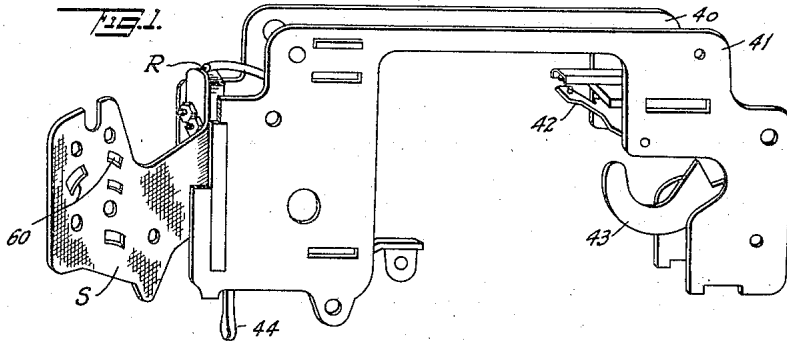
Nov. 11, 1930.

L. CARUSO

1,781,537

ELECTRICAL TOY

Filed March 16, 1929



INVENTOR,  
Louis Caruso

BY *Jacob Shberman*  
his ATTORNEY,

# 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

## ELECTRICAL TOY

Application filed March 16, 1929. Serial No. 347,557.

The present invention relates to electrical toys and is more particularly directed toward the provision of improved toy electric motors for locomotives and toy power plants.

5 In the wiring of these toy electrical devices heretofore available, it has been customary to employ separate wires or leads for connecting the motor terminals and current supply terminal to the reversing switch or controller. These wires have not been entirely satisfactory as they were likely to be lost, mislaid, or improperly connected so that the motor would not run or so as to produce short circuits. They were also somewhat detrimental to the workmanlike appearance of the toy.

10 The present invention contemplates a toy locomotive or power plant in which all the wiring is carried by permanently connected units so that no loose wires are necessary. The motor is provided with a brush rigging and terminal unit of the nature shown in application Serial No. 273,025, filed April 26, 1928, and is provided with a reversing switch preferably automatically operated. Such a reversing switch unit is shown in application Serial No. 154,333, now Patent No. 1,744,950. These units have terminals disposed in predetermined fashions and heretofore these terminals have been connected together by wires. According to the improved form of construction, a single multiple conductor device is employed for this purpose.

In these drawings:

35 Figure 1 is a perspective view of a motor sub-frame carrying an automatic reversing switch and showing the multiple conductor strip secured to it;

40 Figure 2 is a perspective view of a motor with the multiple conductor strip in place;

Figure 3 is an end view of the motor; and Figure 4 is a wiring diagram.

45 The wiring diagram of the motor is shown in Figure 4. The track rails of the toy railroad are indicated at 10 and 11 and a third rail at 12. These rails are connected to the battery or power source 13 through a switch 14, as indicated. The current collector of the locomotive is indicated at 15, and by means of connections permanently carried in the

motor and indicated at 16, the current is conducted to a current supply terminal 17 supported on an insulating terminal assembly 18, as shown more in detail in one of the applications above referred to. This terminal assembly also is provided with fixed terminals 19, 20 and 21. The terminal 19 is connected to one of the brushes 22 of the motor armature A while the terminal 21 is connected to the other brush 23 thereby permanently connecting in the armature and brushes. The terminal 20 is permanently connected to a field F grounded to the frame of the locomotive or toy motor as indicated.

55 The reversing switch R is diagrammatically indicated at the left at Figure 4. This switch has five fixed contacts or terminals 24, 25, 26, 27 and 28, and two movable conductor strips 29 and 30. The contacts 26 and 28 are connected by a conductor 28'. The details of this switch are shown in one of the applications above referred to. The movable conductor strips are adapted to be oscillated about a center 31. The terminals 17 and 24 are connected together by a conductor 32, while the contacts 20 and 25 are connected by a conductor 33, contacts 21 and 27 by a conductor 34, and the contacts 19 and 26 are connected by a conductor 35.

60 The connections between the various contacts in the motor armature and field are such that the direction of rotation of the motor armature is changed when the reversing switch is shifted from one position to the other. This shifting may be accomplished manually or automatically by employing the construction above referred to. As above indicated, it has heretofore been the practice to employ separate wires or leads for the conductors 32, 33, 34, 35, but the present invention contemplates the use of a unitary multiple conductor strip for this purpose.

65 The sub-frame of the automatic reversing unit, as indicated in the drawings, consists of two plates 40 and 41 with appropriate cross pieces and parts to support the reversing switch R, its actuator, field controlled armature 42 and manual control 43 for disabling the actuator for the automatic switch. The

reversing switch R may also be manually operated by a shift arm indicated at 44.

The reversing switch R has four binding posts indicated at 24, 25, 26, and 27, which correspond with the terminals diagrammatically illustrated in Figure 4. These four binding posts are in the form of threaded studs adapted to receive nuts 24<sup>a</sup>, 25<sup>a</sup>, 26<sup>a</sup>, and 27<sup>a</sup>.

The motor frame, as indicated, includes a pair of side plates 50 and 51 secured together by distance pieces and adapted to carry the motor field and armature, the reversing switch and current collecting device and power driven devices such as driving wheels, pulleys, etc. For simplicity in the drawings, these structural details are omitted. The motor frame also carries the insulating plate 18, on which are mounted the terminals 17, 19, 20, and 21 as well as brushes 22 and 23. The terminals just referred to are in the form of threaded studs and are adapted to receive nuts 17<sup>a</sup>, 19<sup>a</sup>, 20<sup>a</sup>, and 21<sup>a</sup>. In assembling the motor, the sub-frame with reversing switch and control, and the main frame with armature and field structures and the controller sub-assembly 18 are assembled into a unit. The current collecting devices 15 are also secured to this assembly but the details of this construction are omitted in the drawings. This leaves the motor parts ready for wiring or connecting the pairs of terminals so that the reversing switch may control the direction of rotation of the motor.

According to the present invention, the wiring in of the motor is accomplished by the multiple conductor strip above indicated and shown herein at S. This strip, as shown in my co-pending application No. 333,563, filed January 19, 1929, consists of two laminations of insulating sheet material and an interposed sheet metal stamping. This stamping is shaped so that a number of separate independent conductors may be made by punching holes through the strip S. Such holes are indicated in the drawing at 60. The multiple conductor strip S is thus made to have four strips numbered 32', 33', 34', and 35', corresponding with the leads indicated in Figure 4. The ends of these conducting strips are punched to have holes, as indicated in Figure 1. These holes are spaced so as to fit the corresponding terminals.

In assembling the device, the multiple conductor strip is placed on one set of terminals, the nuts tightened in place, and then the strip is bent around the corner of the motor frame, slipped over the other set of terminals and the nuts tightened in place. A screw 61 may be employed to secure the central part of the strip to the frame and to keep this strip from being rubbed by the driving wheels of the toy locomotive.

It will, of course, be understood that the description of the present invention as ap-

plied to a toy locomotive is merely for the purpose of convenience, as it may equally well be applied to other forms of electrical toys for the purpose of connecting reversing switches and motor terminals, or for other analogous purposes.

What is claimed is:

1. A motor for toy locomotives and the like, comprising a frame carrying the field and armature of the motor, a terminal assembly for the armature and field windings, a reversing switch having a terminal assembly, and a unitary conductor strip having a plurality of conductors permanently carried thereby and spaced at their ends to fit the terminal assemblies and connect predetermined terminals so that operation of the reversing switch may reverse the motor.

2. A motor for toy locomotives and the like, comprising a frame carrying the field and armature of the motor, a terminal assembly for the armature and field windings, a reversing switch having a terminal assembly, and a unitary conductor strip having a plurality of conductors permanently carried thereby and having holes at their ends to receive the terminals on the terminal assemblies and connect predetermined terminals so that operation of the reversing switch may reverse the motor.

3. In a toy locomotive or the like, a motor having an armature and field, one side of the field being grounded, the other side being connected to a fixed terminal, the armature leads being connected to fixed terminals, a current supply terminal, a reversing switch having four terminals, and a unitary multiple conductor strip having four conductors whose ends are spaced to fit the terminals, the conductors being arranged to connect the reversing switch so as to reverse the motor.

4. In a toy motor, a terminal assembly carrying four projecting terminals for the current supply, the armature leads and a field lead, a reversing switch having four terminals, and a four conductor strip adapted to fit the terminals and connect them in predetermined order whereby operation of the reversing switch will reverse the motor.

5. In a toy motor, a terminal assembly carrying four projecting terminals for the current supply, the armature leads and a field lead, a reversing switch having four terminals, and a four conductor strip adapted to fit the terminals and connect them in predetermined order whereby operation of the reversing switch will reverse the motor, the terminals being in two different planes, the strip being bendable to permit fitting the strip in place.

6. In a toy motor two sets of terminal assemblies having terminals in fixed relative position, and a unitary multiple conductor strip having conductors to connect prede-

terminated terminals of one assembly with  
corresponding terminals of the other assem-  
bly, the conductors being covered with in-  
sulation, except at their ends and the strip  
5 and conductors being bendable to facilitate  
assembly.

Signed at Irvington, in the county of Es-  
sex, and State of New Jersey, this 12th day  
of March, 1929.

LOUIS CARUSO.

10

15

20

25

30

35

40

45

50

55

60

65