

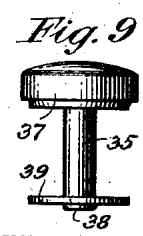
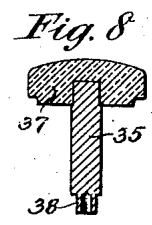
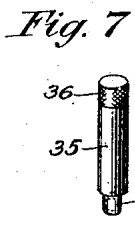
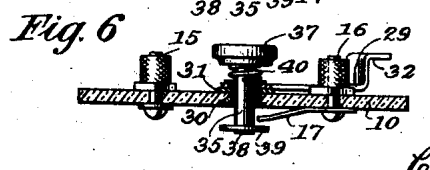
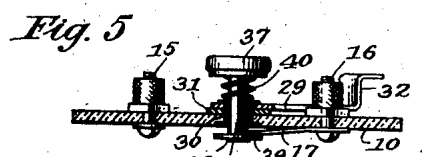
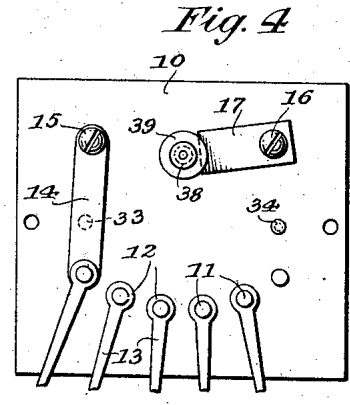
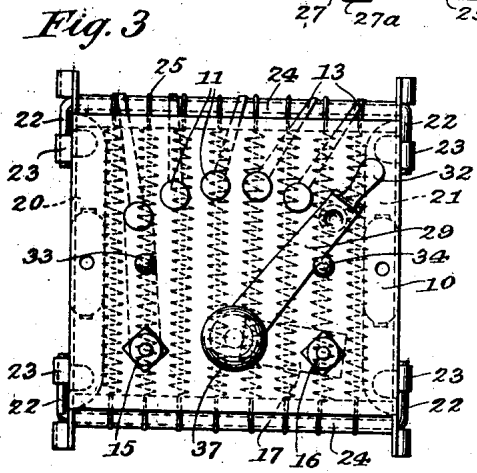
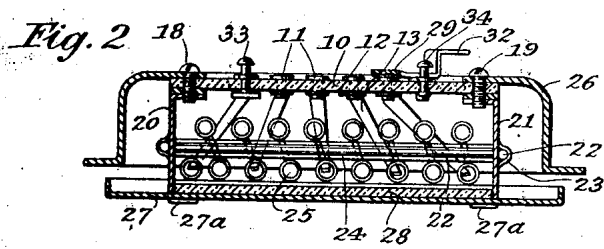
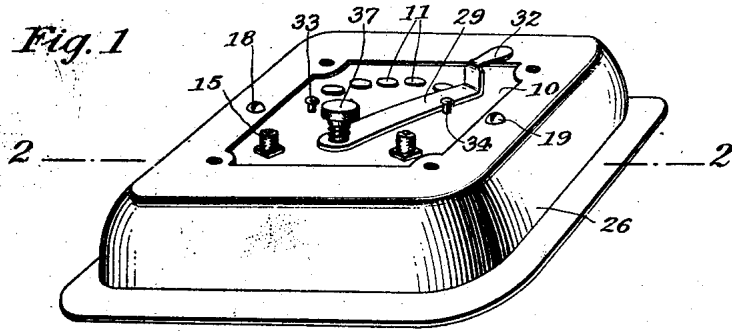
March 12, 1929.

W. E. THORN

1,704,775

RHEOSTAT

Filed Dec. 19, 1924



INVENTOR.
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UNITED STATES PATENT OFFICE.

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RHEOSTAT.

Application filed December 19, 1924. Serial No. 756,889.

The present invention relates to an improved rheostat, particularly of the type adapted for use with toy electric railways, or other electrical toys or devices, and has for an object to provide a device of this character of very simple and economical construction, and which at the same time will be strong, durable, and reliable in operation.

In such devices as previously constructed, the movable parts were so connected that with more or less normal usage they would become loosened and separated, and because of the electrical nature of the device this was apt to prove dangerous, as well as inconvenient in rendering the device inoperative. It is an object of the present invention, therefore, to provide a rheostat in which the movable parts are connected in such manner that loosening or separation, either from careless handling or long use, is prevented.

According to the present invention, these movable parts consist of a switch arm adapted to be moved from one contact point to another in the usual manner, and a push button, adapted to cut out the current upon being pressed, so that the device being controlled through the rheostat may be started and stopped, without changing the position of the switch arm, and it is an object to provide such movable parts assembled in such manner that they cannot become loosened or separated, the connection being free of any threaded or other non-fixed part.

With the above and other objects in view, an embodiment of the invention is shown in the accompanying drawings, and this embodiment will be hereinafter more fully described with reference thereto, and the invention will be finally pointed out in the claims.

In the drawings:

Fig. 1 is a perspective view of a rheostat, according to the present embodiment of the invention;

Fig. 2 is a vertical sectional view, taken along the line 2—2 of Fig. 1;

Fig. 3 is a plan view of the inner structural part of the rheostat, the cover and base being removed;

Fig. 4 is a bottom plan view of the insulation contact carrying plate;

Fig. 5 is a vertical sectional view of the insulation plate, showing the push button in its normal operative position;

Fig. 6 is a similar view, showing the button in its pressed inoperative position;

Fig. 7 is a perspective view of the post or stem of the button;

Fig. 8 is a sectional view showing the same with an insulation head molded thereon; and

Fig. 9 is a side elevation of the push button, with its end plate portion secured.

Similar reference characters indicate corresponding parts throughout the several figures of the drawings.

Referring to the drawings, the rheostat, according to the present embodiment of the invention, comprises a plate 10, of fibre, or other suitable insulation material, provided with a series of metal contacts 11 arranged in an arc, and being in the form of rivets having their heads exposed and raised at the upper side of the plate, and their lower ends engaged in the eyelet ends 12 of connector wires 13, and connected by riveting over said ends. One end contact is not connected to a wire, the switch arm being engaged with this contact to shut off the current, while the other end contact is connected to the end of a bar 14, the other end of which is connected to a terminal post 15. The other terminal post 16 is connected to a plate 17 adapted to be electrically connected to the switch arm and push button, as will presently more fully appear.

The plate 10 is adapted to be secured by screws 18 and 19 to the upper flanged ends of the side members 20 and 21 of a resistance supporting frame, the frame also including end members comprising a wire 22 bent at its ends into relation with the side members and secured by struck up clamp portions 23, and covered with a sheath 24 of insulation material. A coiled resistance wire 25 is supported between said end members, and is connected at its ends, by soldering, to the end connection wires 13, the intermediate wires 13 being also connected to said wire at points intermediate the ends, as clearly shown in Fig. 2.

A centrally apertured and flanged cover plate 26 is secured over the resistance frame and plate 10 by means of the screws 18 and 19 connecting the frame and plate 10, and a base plate 27 is secured to the under side of the resistance frame by means of lugs 27^a on the side members of said frame, an insulation plate 28 being disposed between said plate and the resistance wire, and the bottom edge of the base plate being spaced from the cover plate to provide for ventilation and dissipation of heat.

The switch arm 29 is pivotally mounted upon the plate 10 by means of a flanged rivet eyelet 30 engaged in an aperture in said plate, a washer 31 being interposed between the arm and the plate. The outer end of the arm is provided with a handle portion 32, and is adapted to be moved into engagement with the contacts 11, being limited in its extreme positions by pegs 33 and 34 secured in the plate. The plate member 17, it will be noted, is bent away from the surface of the plate 10, and there is no direct electrical contact or connection with the switch arm.

This electrical connection is provided by means of a push button, and is also adapted to be broken by operation of this button. The manner of forming and assembling this button, and its consequent functional advantages in cooperation with the switch arm, form an important feature of the invention.

The button consists of a central post or stem 35, upon the upper roughened end 36 of which there is rigidly molded a head 37, formed of bakelite, rubber composition, or other suitable insulating material, adapted to be fixedly molded to the stem, as distinguished from a threaded, or other separable connection. The lower end of the stem is reduced and drilled, as at 38, to provide a shoulder and a rivet structure adapted to receive and fixedly secure a centrally apertured end plate 39, as shown in Fig. 9, this plate being secured, however, after assembly of the stem in the plate 10.

In assembling the push button a coil spring 40 is engaged upon the stem beneath the head, and the stem is inserted through the eyelet 30, the plate 39 being then secured by peening over the rivet end portion 38. The spring normally raises the button, pressing the plate 39 into engagement with the plate 17, which is of such length as to engage the plate 39, but not the stem of the button, so that normally the current to the switch arm is completed through the plate, stem and eyelet, and the switch arm may be operated to close the circuit to the toy or other electric device and control the amount of current through varying the resistance.

In order to open or break the circuit, without moving the switch arm, the button is depressed, as shown in Fig. 6, moving the plate 39 out of contact with the plate 17, so that no current passes to the switch arm. Such operation is found desirable in toy electric railways.

The solid, practically one-piece construction of the push button provides a structure which may be operated indefinitely, without loosening or separation, and which permits the switch to be moved back and forth about its pivot mounting, without any tendency to loosen or separate the button.

I have illustrated and described a preferred and satisfactory embodiment of the invention, but it will be obvious that changes may be made therein, within the spirit and scope thereof, as defined in the appended claims.

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

1. In a rheostat, a frame-like structure including a top plate of insulating material, a series of spaced contacts on said plate, spaced binding posts supported by said plate, an arm connecting one of said binding posts with the adjacent end contact of said series, resistance means arranged within the frame and connected with said contacts, a push button including a shaft slidable through an opening in said plate, a metal disk supported by the shaft beneath said plate, a switch arm pivoted about said shaft and adapted to be moved into engagement with said contacts, a resilient contact arm arranged beneath said plate and terminally supported by the other of said binding posts, said contact arm being spaced from said plate and having its free end lying above said disk, and a coil spring surrounding said shaft and normally holding the latter elevated with said disk in engagement with said contact arm for the purpose specified.

2. In a rheostat, a frame-like structure including opposed side walls formed at their upper ends with inwardly directed flanges, clamps struck from said side walls, substantially U-shaped end members embracing the side walls and having their terminals received by said clamps, a plate of insulating material reposing upon said flanges and secured thereto and constituting the top wall of the frame, a bottom wall, bendable lugs projecting from the side walls and passed through said bottom, a series of spaced contacts supported on said plate, spaced binding posts thereon, an electrical connection between one of said posts and the adjacent end contact of said series, a resistance means arranged within the frame and supported by said end members and connected with said contacts, a spring influenced normally elevated push button including a shaft slidable through an opening in said plate, a switch arm pivoted about said shaft and adapted to be moved into engagement with said contacts, a disk carried by said shaft, and a contact arm supported by the other of said binding posts and having its free end normally engaged by said disk for the purpose specified.

Signed at Bridgeport, in the county of Fairfield and State of Connecticut, this 16 day of December A. D. 1924.

WILLIAM E. THORN.