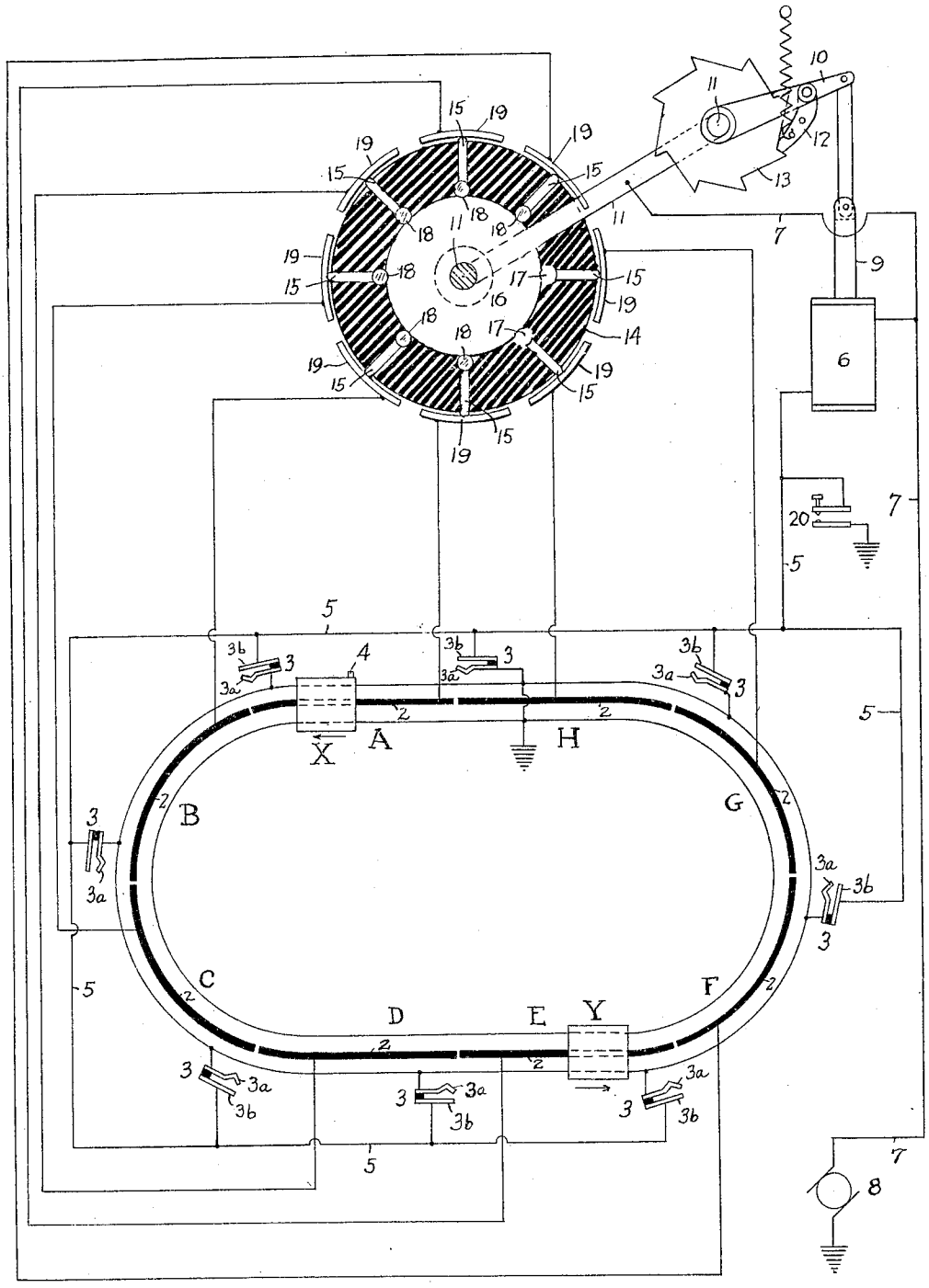
June 28, 1932. L. W. ROSENTHAL 1,865,276

SYSTEM OF CONTROL FOR TOY ELECTRIC RAILWAYS

Filed Feb. 26, 1931



INVENTOR

Leon W. Rosenthal

Patented June 28, 1932

1,865,276

UNITED STATES PATENT OFFICE

LEON W. ROSENTHAL, OF NEW YORK, N. Y.

SYSTEM OF CONTROL FOR TOY ELECTRIC RAILWAYS

Application filed February 26, 1931. Serial No. 518,330.

This invention relates to toy electric railways, and more particularly to a system of control and apparatus therefor.

A primary object of this invention is, given a number of associated electrical elements, to provide means for controlling, operating or energizing successively (in a given cycle) a different group of said elements. And as corollary thereto, it is also an object to provide a system of control utilizing the above described means.

A specific application of the present invention is herein shown and described as applied to the control of trains in toy electric railways.

Referring to the accompanying drawing illustrating this specific application, there is shown, more or less diagrammatically, a toy electric railway made up of a plurality of track sections A to H inclusive, joined to each other in the usual manner, but each section having its power rail 2, 2, insulated from the others. On said railway are shown two trains or locomotives X and Y respectively indicated as running in the same direction. The object is to keep the following train Y at least a predetermined number of sections behind the leading train X and corollary thereto to stall the following train in the event the number of sections between the leading and following trains is less than the predetermined number. To this end there are provided at or near the junctures of the various track sections electric switches 3, 3, which are arranged to be operated in succession by the train X, through the projection 4 thereon, as it passes said switches in its circuit around the track. The members 3*a*, 3*a*, of the said switches are each connected to one of the track rails of the railway, which is usually grounded as shown. The other members 3*b*, 3*b* of said switches are each connected to a common conductor 5 connected to one end of a solenoid 6. The other end of said solenoid is connected by conductor 7 to the source of current 8. The plunger 9 is connected to a lever 10 pivoted on a shaft 11. Mounted on said lever is a pawl 12 which is arranged to advance a ratchet wheel 13, rigid with the shaft 11, one tooth each time the plunger is pulled down into the solenoid. Also rigidly mounted on said shaft and rotatable therewith and with said ratchet wheel is a disc 14 of insulating material provided with a plurality of radiating brush members 15, 15, at the focus or center of which is a disc 16 of conducting material. The insulating disc has a plurality of holes 17, 17, therein, one for each brush member, separating each of said brush members from the conducting disc, and each of these holes is arranged to receive a conducting plug 18 whereby the said brush members may be individually electrically connected with said conducting disc. The power rails are each electrically connected to separate contact segments 19, 19, disposed circumferentially around the disc 14. The number of such segments is the same as that of the brush members, and each of said brush members is, normally, in contact with said segments, as clearly shown.

It has been predetermined, as will be seen from the drawing, that the power rails of two adjacent track sections shall always be disconnected from the source of current— that is, for the particular setting. This is evidenced by the fact that two of the brush members are not electrically connected to the conducting disc, which latter is connected to the current source through the common conductor 7 and the shaft 11. The absence of the conducting plugs in two of the holes evidences that. And at the particular interval illustrated the power rails of sections G and H are disconnected from the source or de-energized, while the other power rails are energized.

It will be apparent that if the disc 14 is advanced or rotated one segment six consecutive power rails will still be energized while

two adjacent power rails will be de-energized, but the new group of six will contain a power rail not in the preceding group of six, and the new group of two de-energized power rails will include a power rail not in the preceding group of de-energized power rails, wherefore in each instance the new group is a different one from the one preceding.

The rotatable disc 14 is advanced one segment every time the ratchet wheel is advanced one tooth by the pawl, and the pawl is actuated every time the plunger is actuated by the energized solenoid, which energization, in the present instance, is effected every time the train X passes a switch 3.

The complete operation is therefore as follows: At the interval illustrated in the drawing track sections A to F inclusive are energized, while sections G and H are de-energized. Train X is on section A and running, while train Y is on section E and also running, both in the same direction. When train X passes the switch at the juncture of A—B, the projection on said train closes said switch, thereby providing a ground connection for the solenoid circuit to complete the same. Current at that instant will therefore pass through said solenoid and will act to draw down the plunger to actuate the pawl to advance the ratchet wheel one tooth and the disc 14 one segment. Section A is now dead, H remains de-energized, and G is made alive or energized. Therefore B to G inclusive are now alive and A and H are dead. B—G is a different group from A—F. A—H is a different group from G—H. When train X passes the switch at B—C the disc 14 is advanced another segment so that B is made dead and H is made alive. At this point C to H inclusive are alive and A—B are dead. And so on around the track until the initial position is reached, with each advance of the disc 14 a new (different) group of sections is energized. That is, given a number or set of associated electrical elements, means are provided for controlling, operating or energizing successively (in a given cycle) a different group of said elements.

The control may be taken away at any time from the train X by operating a manual switch 20 connected at one side to common conductor 5 and at the other side grounded. If desired, the control may be solely by operation of switch 20, by disconnecting all the switches 3 or by removing the projection 4 from the locomotive X. Furthermore, control means within my invention may be applied to various other groups or combinations of track and/or way elements of a toy electric railway.

This application is a continuation in part of my copending application Serial No. 494,534, filed November 10, 1930.

Having described my invention, what I claim is:

1. A system of control for toy electric railways comprising a plurality of track sections, each containing a separate insulated power rail, associated electrical elements, means for controlling successively different groups of said sections and means separate and disconnected from said power rails for enabling the first means to be operated.

2. A system of control for toy electric railways comprising a plurality of track sections, each containing a separate insulated power rail, associated electrical elements, means for controlling successively different groups of said sections and means separate and disconnected from said power rails for enabling the first means to be operated, each group consisting of the same number and relation of elements.

3. A system of control for toy electric railways comprising a plurality of associated electrical elements, means for controlling successively different groups thereof, each group consisting of the same number and relation of elements, and means for changing the group as to number and relation of elements.

4. A system of control for toy electric railways comprising a plurality of track sections, each containing a separate insulated power rail, associated electrical elements, automatic means for controlling successively different groups of said sections, and means separate and disconnected from said power rails to operate the first means.

5. A system of control for toy electric railways comprising a plurality of track sections, each containing a separate insulated power rail, associated electrical elements, train-controlled means for controlling successively different groups of said sections, and means separate and disconnected from said power rails to operate the first means.

6. A system of control for toy electric railways comprising a plurality of track sections, each containing a separate insulated power rail, associated electrical elements, and a single manually actuated means for controlling successively different groups of said sections through some of said elements.

7. A system of control for toy electric railways comprising a plurality of track sections, each containing a separate insulated rail, associated electrical elements, step-by-step means for controlling successively different groups of said sections, and means separate and disconnected from said power rail for operating the first means.

8. A system of control for toy electric railways comprising a plurality of track sections, each containing a separate insulated rail, associated electrical elements, electrically controlled means for controlling successively different groups of said sections,

and means separate and disconnected from said power rail for operating the first means.

9. A control system for toy electric railways comprising a plurality of track sections, each containing a separate insulated power rail, associated contacts, a common conducting member, means for electrically connecting successively different groups of said contacts to said member, and means separate and disconnected from the power rails for operating the first-named means.

10. A control system for toy electric railways comprising a plurality of track sections, each containing a separate insulated power rail, associated contacts, means for connecting successively different groups of said contacts to a current source, and means separate and disconnected from the power rails for operating the first-named means.

11. A control system for toy electric railways comprising a plurality of track sections, each containing a separate power rail, associated contacts, electrically controlled means for connecting successively different groups of said contacts to a current source, and means separate and disconnected from the power rails for operating the first-named means.

12. A control system for toy electric railways comprising a plurality of track sections, each containing a separate insulated power rail, associated contacts, a common conducting member, electrically controlled means for electrically connecting successively different groups of said contacts to said member, and means separate and disconnected from the power rails for operating the first-named means.

13. A control system for toy electric railways comprising a plurality of track sections, each containing a separate insulated power rail, associated contacts, a common conducting member, step-by-step means for electrically connecting successively different groups of said contacts to said member, and means separate and disconnected from the power rails for operating the first named means.

14. A control system for toy electric railways comprising a plurality of track sections, each containing a separate insulated power rail, associated contacts, a common conducting member, means for electrically connecting ab initio certain of said contacts to said member, means for advancing said first named means so as to electrically connect successively different groups of said contacts to said conducting member, and circuit closing devices therein separate and disconnected from the power rails for operating said advancing means.

15. A control device for toy electric railways comprising a plurality of contacts, a common conducting member, means, subject to rearrangement at the will of the operator, for electrically connecting ab initio certain of said contacts to said member, and means for advancing said first-named means so as to electrically connect successively a different group of said contacts to said conducting member.

16. A control device for toy electric railways comprising a plurality of contacts, and a rotatable member having a plurality of brush members engaging said contacts, a main conducting member, and individual means for electrically connecting any or all of said brush members to said conducting member.

17. A control device for toy electric railways comprising a plurality of contacts, a rotatable member having a plurality of brush members engaging said contacts, a main conducting member and individual means for electrically connecting any or all of said brush members to said conducting member, and means for rotating said rotatable member.

18. A control device for toy electric railways comprising a plurality of contacts, a rotatable member having a plurality of brush members engaging said contacts, a main conducting member and individual means for electrically connecting any or all of said brush members to said conducting member, and step-by-step means for advancing said rotatable member.

19. A control device for toy electric railways comprising a plurality of contacts, a rotatable member having a plurality of brush members engaging said contacts, a main conducting member, and individual means for electrically connecting any or all of said brush members to said conducting member, and electrically controlled means for rotating said rotatable member.

20. A control device for toy electric railways comprising a plurality of circularly disposed segmental contacts, a rotatable disc of insulating material having a plurality of radially extending brush members engaging said contacts, a conducting disc at the focus of said brush members normally electrically disconnected from said brush members, and independent means for connecting said brush members to said conducting disc.

21. A control system for toy electric railways comprising a plurality of track sections, each containing a separate insulated power rail, and means embracing electric circuits and circuit closing elements therefor to energize some of said power rails in a changing group by including each power rail successively in said group and simultaneously omitting another rail of said group by deenergizing same, so that the number of rails in said group remains constant.

22. A control system for toy electric railways comprising a plurality of track sec-

tions forming a track loop, each section containing a separate insulated power rail, and means comprising circuits and circuit closing elements for energizing some of said power rails in a changing group by including each of the remaining rails in said group and simultaneously omitting one of the power rails therefrom by deenergizing it, in a progressive manner around the entire circumference of said loop.

In testimony whereof I affix my signature.

LEON W. ROSENTHAL.