Sept. 19, 1939. R. V. KING 2,173,483

REMOTE CONTROL SYSTEM FOR TOY TRAIN ACCESSORIES

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Fig. 1.

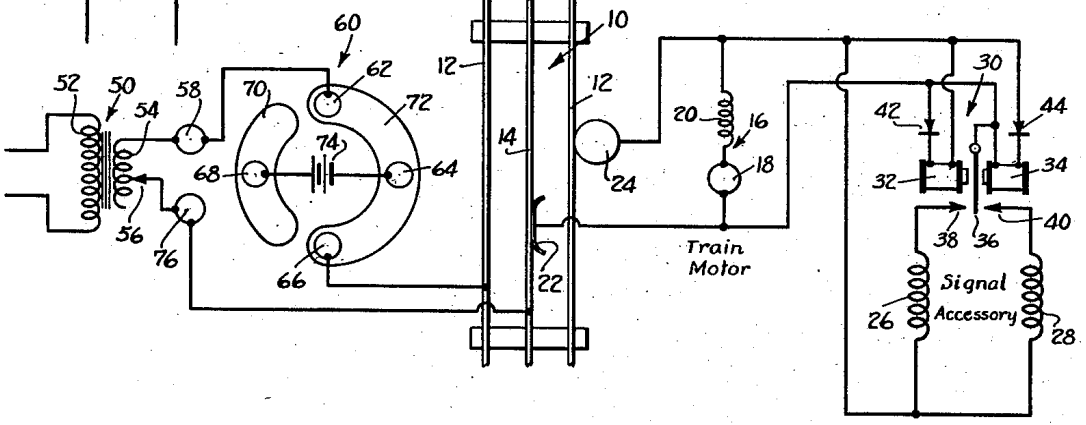


Fig. 2.

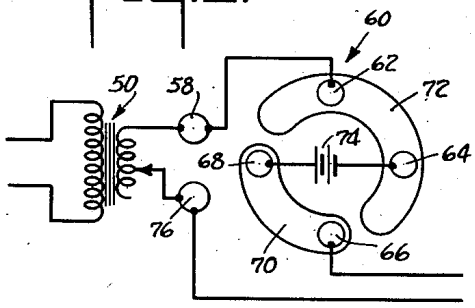
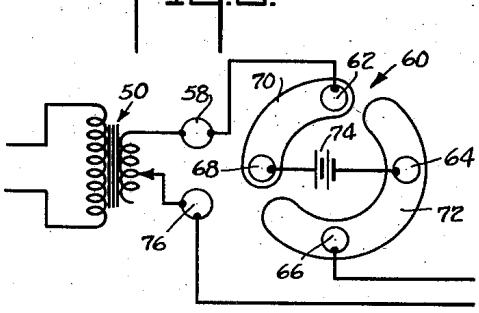


Fig. 3.



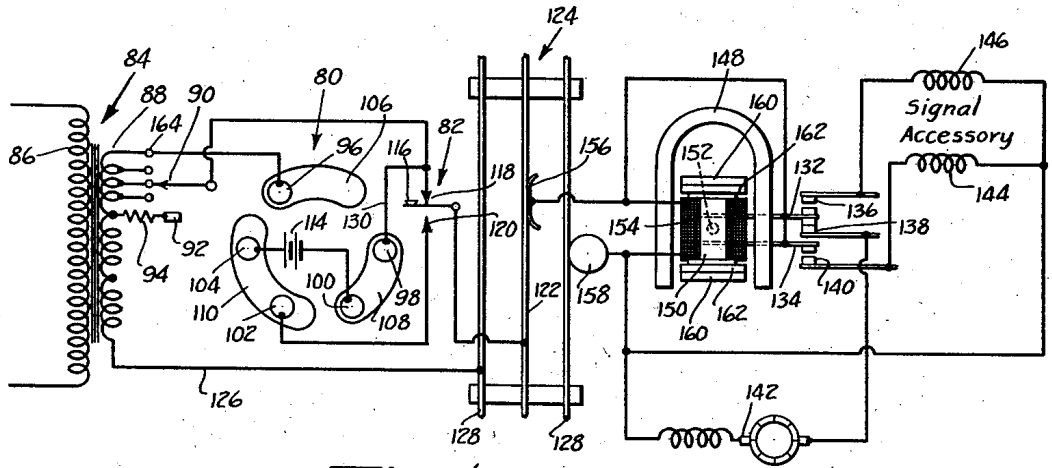


Fig. 4.

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Fig. 5.

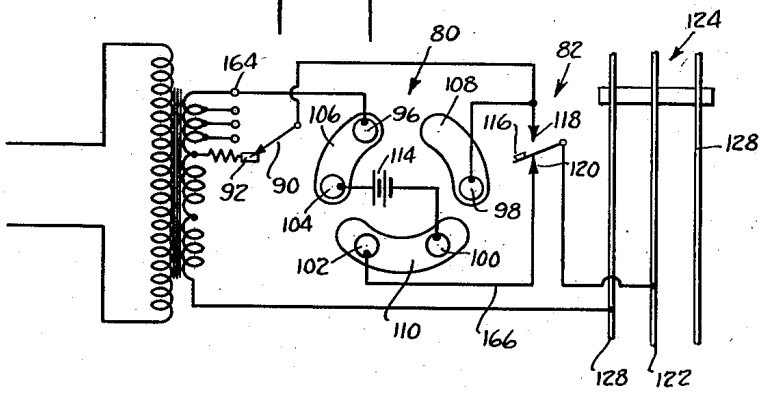


Fig. 6.

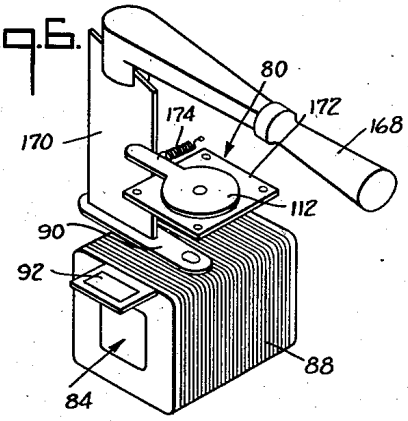
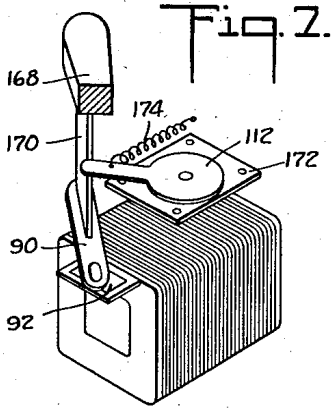


Fig. 7.



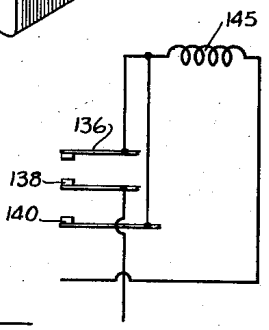


Fig. 10.

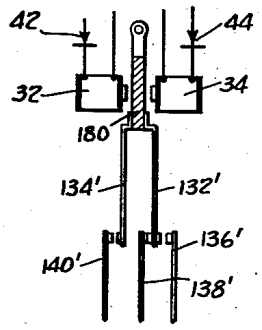


Fig. 8.

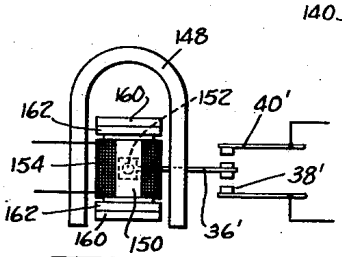


Fig. 9.

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REMOTE CONTROL SYSTEM FOR TOY TRAIN ACCESSORIES

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Application May 19, 1936, Serial No. 80,503

8 Claims. (Cl. 104—149)

This invention relates to toy trains and more particularly to a control system for remotely controlling a whistle, horn, bell, or like accessory on a toy train.

The primary object of the invention is to generally improve remote control systems for toy trains, particularly for the remote control of one or more signal accessories on a toy train.

A more particular object is to make possible the operation of such a signal accessory at full voltage regardless of whether the train is stopped or running, and while using an accessory which is energized by the same current as is employed for the driving motor of the train. Still another object is to attain this desired result while using a simple key or push-button or the like for remotely controlling the warning signal or other accessory on the train, the more complicated circuit changes necessary to compensate for whether or not the train is running being taken care of by automatically operated switch mechanism the position of which is responsive to the regular speed control handle of the train controller.

To the accomplishment of the foregoing and such other objects as will hereinafter appear, my invention consists in the remote control system for toy trains, and the elements thereof, and their relation one to another as are hereinafter more particularly described in the specification and sought to be defined in the claims. The specification is accompanied by drawings in which:

Fig. 1 is a schematic wiring diagram explanatory of one form of my invention, with the manually operable control switch or assembly in mid-position;

Fig. 2 shows the manually operable control switch in one extreme position;

Fig. 3 shows the switch in opposite extreme position;

Fig. 4 is a schematic wiring diagram showing a modified form of the invention which makes possible full voltage operation of a signal accessory regardless of whether or not the train is running;

Fig. 5 shows the control assembly of Fig. 4 with the parts moved to different position;

Fig. 6 is a perspective view showing the relation between the speed control handle and the automatically operable switch of the control assembly;

Fig. 7 is a similar view showing the position of the parts with the speed control handle in the "off" or stopped position;

Fig. 8 illustrates a modification of the relay shown in Fig. 1;

Fig. 9 illustrates a modification of the relay shown in Fig. 4; and

Fig. 10 shows the relay of Fig. 4 connected to a single signal accessory.

Referring to the drawings and more particularly to Fig. 1, I show a toy track section 10 which may be of conventional type in comprising grounded outer rails 12 and an insulated center or third rail 14. The parts shown at the left of track 10 are stationarily positioned at the trackside, while the parts shown at the right of track 10 are mounted on the train. The latter include a driving motor for the train indicated at 16 and comprising a series connected armature 18 and field 20. The motor is energized by current collected from third rail 14 by a suitable shoe 22, the circuit being completed to ground through the wheels 24 of the train. Connected in parallel with motor 16 are any desired signal accessories, such as a whistle, a horn, a bell, or the like. In the present case, one such accessory is schematically indicated at 26 and another at 28. The energization of the accessories is controlled by a suitable relay 30 comprising oppositely disposed magnets 32 and 34 with an armature 36 movable therebetween. On energization of magnet 32, the armature 36 is closed against contact 38, thereby energizing accessory 26, while on energization of magnet 34 the armature 36 is closed against contact 40, thereby energizing accessory 28. Magnets 32 and 34 are connected in parallel with one another and in parallel with the driving motor 16, but rectifiers 42 and 44 are connected in series with the magnets, these rectifiers being oppositely faced, or connected in opposite legs of the circuit, as shown. When the conventional alternating current is applied to the track 10 and thence to the relay magnets, the attraction of the magnets is balanced and the armature 36 remains in mid-position, thus opening the circuits of the signal accessories 26 and 28. It will be appreciated, however, that on the application of a direct current to the track 10, one relay will be energized and the other de-energized, depending upon the direction in which the direct current is fed to the track. By superposing even a small direct current on the ordinary alternating power current, the relay 30 is operated and the signal accessory, for example a whistle, may be energized, the whistle being driven by the alternating current. By feeding the direct current to the track in opposite polarity, the relay armature 36 may be drawn in opposite direction and another signal accessory,

for example a bell, may be operated by the alternating current supply.

It will be understood that while I have spoken of operation of the accessories by the alternating current supply, it is also possible to operate the same by the direct current itself. However, the use of alternating current is preferred, for in such case a minimum of direct current is required, it being used solely for control purposes, and the direct current may be supplied by small dry cells of the flashlight battery type, as is hereinafter described. It will also be understood that if only one accessory is desired, the contacts 38 and 40 may be connected together and thence through the single accessory, or the rectifiers 42 and 44 may be omitted, the magnets being so wound and connected that the armature is unaffected by alternating current but is moved by direct current. However, when only one accessory is to be operated, I prefer to employ a somewhat more complex system, subsequently described in connection with Fig. 4, which system makes possible the application of the full alternating current voltage to the accessory, regardless of whether or not the driving motor of the train is in operation.

Coming now to the trackside control elements shown at the left of track 10 in Fig. 1, I employ a conventional step-down transformer 50 the primary 52 of which is connected to a power-line wall outlet plug, and the secondary 54 of which is provided with a speed control handle 56 which varies the output potential of the transformer.

In accordance with the present invention, I interpose between transformer 50 and track 10 a control switch or control assembly, generally designated 60. This comprises stationary contacts 62, 64, 66, and 68 over which are oscillatably disposed switch segments 70 and 72. It will be understood that segments 70 and 72 are mounted on a suitable oscillatable insulation lever and that the segments are in fixed relation to one another and are simultaneously moved about an axis at the center of the segments. Contacts 62 and 66 are connected in series between transformer terminal 58 and grounded rail 12 of the track, while contacts 64 and 68 have connected thereacross any suitable source of direct current, preferably a direct current battery 74. Inasmuch as the current consumption is small, this battery may employ flashlight cells which are readily concealed within a small casing or housing carrying the control assembly 60. The other terminal 76 of the transformer is connected directly to the third rail 14 of the track.

With the manually operable control switch 60 in the position shown in Fig. 1, which is the center or mid-position, the battery 74 is open-circuited and the output of transformer 50 is applied directly to the track. Driving motor 16 is energized, but relay 30 is in neutral position and the train accessories are accordingly deenergized.

Referring now to Fig. 2, I show the control switch 60 moved in counter-clockwise direction from the position shown in Fig. 1. In this position of the control switch the energy from transformer terminal 58 flows through contact 62, segment 72, and contact 64, through battery 74 and thence to the track through contact 68, segment 70, and contact 66. In this position the alternating current has superimposed thereon a component of direct current, and the direct current influences one but not the other of the relay magnets, thereby energizing a train signal accessory.

Referring now to Fig. 3, I show the control switch manually moved in opposite direction, that is, in clockwise direction to its other extreme position. In this position, alternating current flows from transformer terminal 58 through contact 62, segment 70, and contact 68 to the battery 74 and thence to the track through contact 64, segment 72, and contact 66. Here again a direct current is superimposed on the alternating current, but the battery 74 is poled in opposite direction and therefore the direct current flows in opposite direction and energizes the other of the two relay magnets and consequently the other of the train accessories where two such accessories are provided.

Assuming the train signal accessory to be operable by solely the alternating current, the system so far described cannot be operated when the train is stopped. A system which overcomes this limitation is schematically illustrated in Fig. 4. In this case the control assembly includes two switches, the first being generally indicated at 80 and the second at 82. For reasons subsequently explained, switch 80 may be and preferably is automatically operated, while switch 82 is manually operated. To obtain automatic operation of switch 80, the switch assembly is preferably incorporated with the transformer or controller generally designated 84. Transformer 84 comprises a primary 86 connected to the conventional household wiring, and a secondary 88 at least a part of which is variably tapped by a suitable speed control lever 90. The latter may be moved to its "off" or stopped position indicated by a contact 92 which ordinarily is an insulated contact so that the transformer circuit is opened, thus stopping the train.

In the present case I show contact 92 connected to the transformer secondary by a resistor 94, but this forms no part of the present invention and is intended merely to establish an exceedingly small holding current in the "off" or stopped position, which prevents undesired reversal of the train when using a remotely controlled reversing system of the type disclosed in copending application of Edward E. McKeige, Serial No. 56,885, filed December 31, 1935. It should be understood that the relatively minute holding current which is supplied to the track through resistor 94 is entirely too small to operate the driving motor or signal accessories of the toy train, and that for all practical purposes the contact 92 may be considered as open-circuited, thus supplying no current at all to the track. When the train is not equipped with remotely controlled reversing mechanism, the resistor 94 is, of course, omitted, and speed control lever 90 in its extreme position actually opens the transformer circuit.

The automatically operable switch 80 comprises stationary contacts 96, 98, 100, 102, and 104, and segments 106, 108, and 110 bearing thereagainst. It will be understood that segments 106, 108, and 110 are mounted on a suitable oscillatable insulation lever (112 in Figs. 6 and 7) and that the segments are in fixed relation to one another and are simultaneously moved about an axis at the center of the segments. A suitable direct current source, preferably flashlight battery cells, is indicated at 114, said source being connected between the contacts 100 and 104.

The control assembly further comprises a manually operable switch 82 which is here illus-

trated in the form of a manually movable key 116 normally biased upwardly against a contact 118 but movable downwardly against a contact 120. It will be noted that with the key 116 in normal or elevated position, energy from the transformer secondary flows from speed control contact 90 to contact 118 and thence through key 116 to the third rail 122 of track 124. The track supply circuit is completed by a conductor 126 connected between the opposite end of transformer secondary 88 and the outer or grounded rails 128 of the track.

However, when key 116 is depressed, the alternating current flows from speed control contact 90 through conductor 130 to contact 98, segment 108, contact 100, and thence through the battery or direct current source 114 to contact 104, segment 110, contact 102, and thence to contact 120 of manually operable switch 82 which, because of the depression of key 116, is in turn connected to third rail 122 of the track. In other words, when key 116 is in normal or elevated position, the battery 114 is open-circuited and the alternating current is fed directly to the track, but when key 116 is depressed the alternating current is fed through battery 114, and a direct current is superimposed on the alternating current.

The relay on the train differs from and is somewhat more complex than that previously described, and is arranged to control the driving motor circuit as well as the signal accessory circuit. Specifically, the relay comprises two contact blades 132 and 134 and three stationary contacts 136, 138, and 140. The contact blades 132 and 134 are shown in mid-position and at this time contact is made with contact 138, this being connected in series with the train driving motor 142. In other words, with the relay in mid-position the motor circuit is closed and the train functions in normal manner. When key 116 is depressed, thereby superimposing direct current on the alternating current, the relay armature oscillates downwardly and contact 134 reaches stationary contact 140, thereby energizing a whistle or like signal accessory 144. It will be understood that relay blade 132 is yieldable and that it simply bears against contact 138 during the additional downward movement needed to close the circuit of the accessory. When the relay is moved in opposite direction, blades 132 and 134 move together, thus opening the circuit of driving motor 142 at contact 138 and closing the circuit of stationary contact 136, thereby energizing a signal accessory 146. Because of the opening of the driving motor circuit, the train may be stopped, yet a relatively high alternating current voltage may be impressed on the signal accessory for effective operation of the same.

At this point, I may explain that while I have shown separate signal accessories 144 and 146 one of which may, for example, be a whistle and the other a bell, I prefer to connect stationary contacts 136 and 140 together and to a single signal accessory 145, as is shown in Fig. 10, so that the accessory may be operated regardless of whether the train is stopped or running.

The relay illustrated in Fig. 4 differs from that shown in Fig. 1 in another respect, in that it does not require the use of rectifiers. The relay comprises a permanent horseshoe magnet 148 between the poles of which there is oscillatably disposed an armature 150 pivoted at 152. Armature 150 carries a winding 154 connected to the third rail wiper shoe 156 and the grounded body or wheels 158 of the train. The armature further carries iron pole pieces 160, but copper or other highly conductive non-magnetic material is disposed between the armature and the pole pieces 160, as is indicated at 162. The frame carrying pivot 152 and armature 150, which has been omitted from the drawings for clarity, is also preferably made of a highly conductive non-magnetic material such as copper. The relatively long slender springy contact blades 132 and 134 are connected at their inner ends to the shaft 152 of armature 150.

When alternating current alone is supplied to the track, the armature remains balanced in mid-position. The flux field produced by the alternating current is blocked by eddy current reaction from the copper shielding. When, however, direct current is superimposed on the alternating current, the flux component produced by the direct current is unimpeded by the copper shielding, and armature 150 is oscillated about pivot 152 in one direction or the other, depending upon the direction of the direct current. The parts are so connected and battery 114 is so poled that with the parts in the condition shown in Fig. 4 the armature swings in a clockwise direction upon depression of key 116.

Referring now to Fig. 5, I show the trackside control apparatus of Fig. 4 with the parts in different position corresponding to stopping of the train. Thus, speed control handle 90 is disposed on contact 92 which corresponds to open-circuit condition or to the feeding of a holding current so minute as to in no way affect the driving motor of the train. At this time, however, the switch 80 has been moved in counter-clockwise direction, and the relation of the parts is therefore entirely changed from that shown in Fig. 4. With the key 116 in elevated position, the speed control handle 90 is connected to contact 118 and thence through key 116 to the third rail 122 of the track. However, either no or no appreciable alternating current is supplied to the track. At the same time, the direct current source or battery 114 is open-circuited. The train, of course, is stopped. On depressing key 116 to operate the train signal, alternating current is fed from any desired part of the transformer secondary, in this case the maximum voltage tap 164, to contact 96, segment 106, and contact 104, and thence through battery 114 to contact 100, segment 110, and contact 102, and thence through wire 166 to contact 112, key 116 and the third rail 122 of the track. Two things should be noted. In the first place, the maximum or any desired substantial alternating current potential is applied to the track. In the second place, the polarity of connection of battery 114 to the track is reversed relative to what it was in Fig. 4. Because of the direction of feed of the direct current, the relay is moved in an upward rather than a downward direction as viewed in Fig. 4, and consequently the circuit of the driving motor is opened at contact 138. The high voltage alternating current supplied to the track therefore does not affect the driving motor of the train but does effectively drive the signal accessory, such as the whistle, bell, or the like.

Switch 80 may, of course, be moved manually, but I prefer to move the same automatically in response to movement of the speed control lever. Thus, referring to Figs. 6 and 7 of the drawings, the outermost winding of the transformer secondary is indicated at 88, the output potential being varied by moving a contact 90

over the secondary. Contact 90 is moved by a speed control lever the handle of which is indicated at 168. Handle 168 and contact 90 are interconnected by a strip of insulation 170. Switch 80 is mounted on an insulation support 172 disposed near strip 170. The insulation lever 112 which carries the switch segments is normally biased to the position shown in Fig. 4, by a suitable pull spring 174. When, however, the speed control lever is swung in a clockwise direction as viewed in the drawings, thus changing the parts from the position shown in Fig. 6 to that shown in Fig. 7 at which time contact arm 90 is disposed over contact 92, the switch lever 112 is moved in a counter-clockwise direction to the position shown in Fig. 5. Whenever the train is running, the automatically operable switch 80 is in the position shown in Fig. 4, and whenever the train is stopped, the switch 80 is automatically shifted to the position shown in Fig. 5. The only thing the child operating the toy has to manipulate manually for signal purposes is the key 116 which, whenever it is in elevated or normal position, results in deenergization of the signal accessory, but whenever the key is depressed the signal is operated. When the train is running, the alternating current potential applied thereto is adequate for operation of the signal. When the train is stopped, an adequate potential is specially applied to the signal but without bringing the driving motor of the train into operation.

It is important to understand that while I have shown two different forms of operating mechanism for the relays in Fig. 1 and Fig. 4, these operating mechanisms are, in fact, interchangeable, and the really significant distinction between the arrangements of Figs. 1 and 4 resides in the use of a single-blade contact in Fig. 1 and a double-blade contact in Fig. 4, rather than in the mechanism for operating the same. Thus, referring to Fig. 8, I show a relay which is generally like that shown in Fig. 1 in comprising magnet coils 32 and 34 fed through oppositely faced rectifiers 42 and 44 and acting upon an armature, but in this case the armature 180 carries two relatively yieldable contact blades 132' and 134', corresponding to the blades 132 and 134 in Fig. 4, and cooperating with three stationary contacts 136', 138', and 140' which are similar in relative spacing and functioning to the corresponding elements in Fig. 4.

On the other hand, I show in Fig. 9 a relay generally like that shown in Fig. 4 in that it comprises a horseshoe magnet 148 having an armature 150 pivotally disposed therein on a pintle 152 and carrying a winding 154 as well as magnetic pole pieces 160 and non-magnetic shields 162. In the present case, however, the armature carries only a single contact blade 36' which cooperates with stationary contacts 38' and 40', the primed numerals corresponding to similar parts in the relay of Fig. 1. As will be understood without further comment, the relay shown in Fig. 9 may be used in the arrangement of Fig. 1 to replace the relay there shown, and the relay shown in Fig. 8 may be used in the arrangement of Fig. 4 to replace the relay there shown.

It is believed that the construction and operation of the remote control toy train signalling systems of my invention, as well as the many advantages thereof, will be apparent from the foregoing detailed description. In the arrangement of Figs. 1 through 3 and 9, either one or two signal accessories may be mounted on the train yet remotely controlled by a manually operable three-position switch which is interposed between the power-line transformer and the track. The desired control is obtained through the use of a small amount of direct current for control purposes, and this may be supplied, if desired, in a simple and inexpensive manner through the use of flashlight battery cells.

With the arrangement shown in Figs. 4 through 8 and 10, the train signal accessory may be energized regardless of whether the train is stopped or running and despite the fact that the signal is itself energized by the same alternating current that is normally used to operate the driving motor of the train. The signal is controlled by a single switch which may take the form of a depressible key or push-button, and this key is all that need be manipulated whether the train is stopped or running. The necessary circuit changes which insure the supply of an adequate operating potential to the track when the train is stopped, are taken care of entirely automatically by movement of the speed control handle of the controller. The train may in this case also be provided with two signal accessories, but in such case only one of the accessories, for example, a whistle, may be operated when the train is running, while the other, for example a bell, may be operated when the train is stopped. The system may be used together with a remote control reversing system, the only precaution to be taken in such case being that the contacts of the key or push-button be so arranged that the change-over is practically instantaneous, too much so for functioning of the reverse relay when the signal key is operated.

It will be apparent that while I have shown and described my invention in preferred forms, many changes and modifications may be made in the structures disclosed without departing from the spirit of the invention, defined in the following claims.

I claim:

1. In a remote control train system for toy trains, a train having a driving motor arranged to be energized by alternating current, a train-carried accessory arranged to be energized by alternating current, and a train-carried selective three-position polarized relay arranged to be energized by direct current, said relay closing a first contact in its deenergized position, a second contact in another position of the relay when energized in one direction, and both the first and a third contact in the third position of the relay when energized in opposite direction, the motor being connected to a pair of track-engaging members through said first contact but not through the other contacts, and the accessory being connected to said track-engaging members through either the second or third contact, and the said relay being connected directly to said track-engaging members, whereby when alternating current only is supplied to said track-engaging members the driving motor alone is energized, and when said track-engaging members are supplied with direct current of one polarity and alternating current, both the driving motor and the accessory are energized, and when said track-engaging members are supplied with direct current of opposite polarity and alternating current, the accessory alone is energized.

2. In a remote control train signal system for toy trains, a train having a driving motor, a train-carried signal accessory, and a train-

carried selective three-position relay, the movable part of said relay having movable contact means cooperating with three stationary contacts in such manner that a first contact is closed in the deenergized position of the relay, a second and different contact is closed in one extreme position of the relay when energized in one direction, and both the first and a third contact are closed in the opposite extreme position of the relay when energized in the opposite direction, the motor being connected to a pair of track-engaging members through said first contact but not through the other contacts, and the signal accessory being connected to said track-engaging members through either the second or third contact, the said relay being connected directly to said track-engaging members, said driving motor and said signal accessory being responsive to a current of one character and said relay being responsive solely to current of a different character, but selectively depending upon a characteristic thereof, whereby when current of said one character only is supplied to said track-engaging members the driving motor alone is energized, when said track-engaging members are supplied with current of both characters to energize the relay to said one extreme position both the driving motor and the accessory are energized, and when said track-engaging members are supplied with current of both characters to energize the relay to said other extreme position the accessory only is energized.

3. A remote control train system for toy trains, comprising a main source of alternating current for energizing the track, an auxiliary direct current source for also energizing the track, a control assembly connected between said sources and the track, a train having a driving motor responsive to the alternating current, a train carried accessory responsive to the alternating current, and a train-carried selective three-position relay connected to said track and constructed to respond to the direct but not the alternating current, said relay closing a first contact in one position of the relay, a second contact in another position of the relay, and both the first and a third contact in the third position of the relay, the motor being energized from the track through said first contact but not through the other contacts, and the accessory being energized from the track through either the second or third contact, said control assembly having appropriate stationary and movable switch contacts so arranged as to connect the direct current source and the alternating current source to the track with the direct current source poled in either direction, and also to connect the alternating current source to the track with the direct current source out of circuit, whereby the driving motor is energized and the accessory deenergized when the first contact only is closed, and the driving motor and accessory are both energized when the first and third contacts are closed, and when the second contact only is closed the signal accessory is energized and the driving motor is deenergized.

4. A remote control train signal system for toy trains, comprising a source of alternating current for energizing the track, a direct current source for also energizing the track, a control assembly connected between said sources and the track, a train having a driving motor responsive to the alternating current, a signal accessory on the train and responsive to the alternating current, and a train-carried selective three-position relay connected to said track and constructed to respond to the direct but not the alternating current, the movable part of said relay having two movable contact blades cooperating with three stationary contacts in such manner that the first contact is closed in neutral position of the relay, a second and different contact is closed in one extreme position of the relay, and both the first and a third contact are closed in the opposite extreme position of the relay, the motor being energized from the track through said first contact but not through the other contacts, and the signal accessory being energized from the track through either the second or third contact, said control assembly having appropriate stationary and movable switch contacts so arranged as to connect the direct current source in series with the alternating current source and both sources to the track with the direct current source poled in either direction to obtain either extreme position of the relay, and also to connect the alternating current source to the track with the direct current source out of circuit, to obtain the neutral position of the relay, whereby the driving motor is energized and the accessory deenergized when the first contact only is closed, and the driving motor and the accessory are both energized when the first and third contacts are closed, and when the second contact only is closed the signal accessory is energized and the driving motor deenergized.

5. A remote control train system for toy trains, comprising a source of alternating current for energizing the track, an auxiliary source consisting of a direct current battery for also energizing the track, a control assembly connected between said sources and the track, a train having a driving motor responsive to the alternating current, a train-carried accessory responsive to the alternating current, and a train-carried selective relay connected to the track and constructed to respond to the direct but not to the alternating current, said relay operating in such manner that a first contact is closed in the neutral position of the relay, a second and different contact is closed in one extreme position of the relay, and both the first and a third contact are closed in the opposite extreme position of the relay, the motor being energized from the track through said first contact but not through the other contacts, and the accessory being energized from the track through the second and third contacts, said control assembly having appropriate stationary and movable switch contacts so arranged as to connect the direct current battery in series with the alternating current source and both sources to the track with the battery poled in either direction, to obtain either extreme position of the relay, and also to connect the alternating current source to the track with the direct current source out of circuit, to obtain the neutral position of the relay, whereby the driving motor is energized and the accessory deenergized when the first contact only is closed, and the driving motor and the accessory are both energized when the first and third contacts are closed, and when the second contact only is closed the signal accessory is energized and the driving motor deenergized.

6. A remote control train system for toy trains, comprising a track, a current supply source having a speed control handle for varying the potential supplied to the track, said handle having an "off" position, a control assembly connected between said source and the track, a train having a driving motor arranged to be connected to the track, an accessory on the train entirely inde-

pendent of and additional to the driving motor, and also arranged to be connected to the track, a train-carried selective three-position relay connected to said track, said relay closing a first contact in one position of the relay, a second contact in another position of the relay, and both the first and a third contact in the third position of the relay, the motor being energized from the track through said first contact but not through the other contacts, and the accessory being energized from the track through either the second or third contact, said control assembly being arranged to put the relay in any of said three positions, and means so connecting the speed control handle and the control assembly that when the speed control handle is moved to "off" position the control assembly is moved from a first to a second position and a high potential is supplied to the track, and the relay is put in its second position, whereby the signal accessory is then energized and the driving motor is deenergized.

7. A remote control train system for toy trains, comprising a track, a step-down transformer having a speed control handle with a movable contact for the secondary of the transformer for varying the potential supplied to the track, said handle having an "off" or "stop" position, a direct current source for also energizing the track, a control assembly including two switch members one of which is automatically moved in response to movement of the speed control handle and the other of which is arranged for manual operation, a train having a driving motor responsive to the alternating current, an accessory on the train responsive to the alternating current, a train-carried selective three-position relay connected to said track and constructed to respond to the direct but not the alternating current, said relay closing a first contact in one position of the relay, a second contact in another position of the relay, and both the first and a third contact in the third position of the relay, the motor being energized from the track through said first contact but not through the other contacts, and the accessory being energized from the track through either the second or third contact, the manually movable control switch operating to connect the direct current source and the alternating current source to the track, or to connect the latter to the track with the direct current source out of circuit, and the automatically moved switch operating to connect the alternating current source into circuit and to reverse the polarity of the direct current source when the speed control handle is in the "off" or "stop" position, whereby the accessory is then energized and the driving motor deenergized.

8. A remote control train system for toy trains, comprising a track, a step-down transformer having a speed control handle with a movable contact for the secondary of the transformer for varying the potential supplied to the track, said handle having an "off" or "stop" position, an auxiliary source consisting of a direct current battery for also energizing the track, a control assembly including two switch members one of which is automatically moved in response to movement of the speed control handle and the other of which is arranged for manual operation, a train having a driving motor responsive to the alternating current, an accessory on the train responsive to the alternating current, a train-carried selective relay responsive to the direct but not the alternating current, operating in such manner that a first contact is made in the neutral position of the relay, a second and different contact is made in one extreme position of the relay, and both the first and a third contact are made in the opposite extreme position of the relay, the motor being energized from the track through the first contact but not through the other contacts, and the accessory being energized from the track through either the second or third contact, the manually movable control switch operating to connect the direct current battery in series with the alternating current source and both sources to the track, or to connect the latter directly to the track with the direct current battery out of circuit, and the automatically moved switch operating to connect the alternating current source into circuit and to reverse the polarity of the battery when the speed control handle is in the "off" or "stop" position, whereby the signal accessory is then energized and the driving motor deenergized.

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