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BLOCK SYSTEM FOR TOY ELECTRIC RAILROADS

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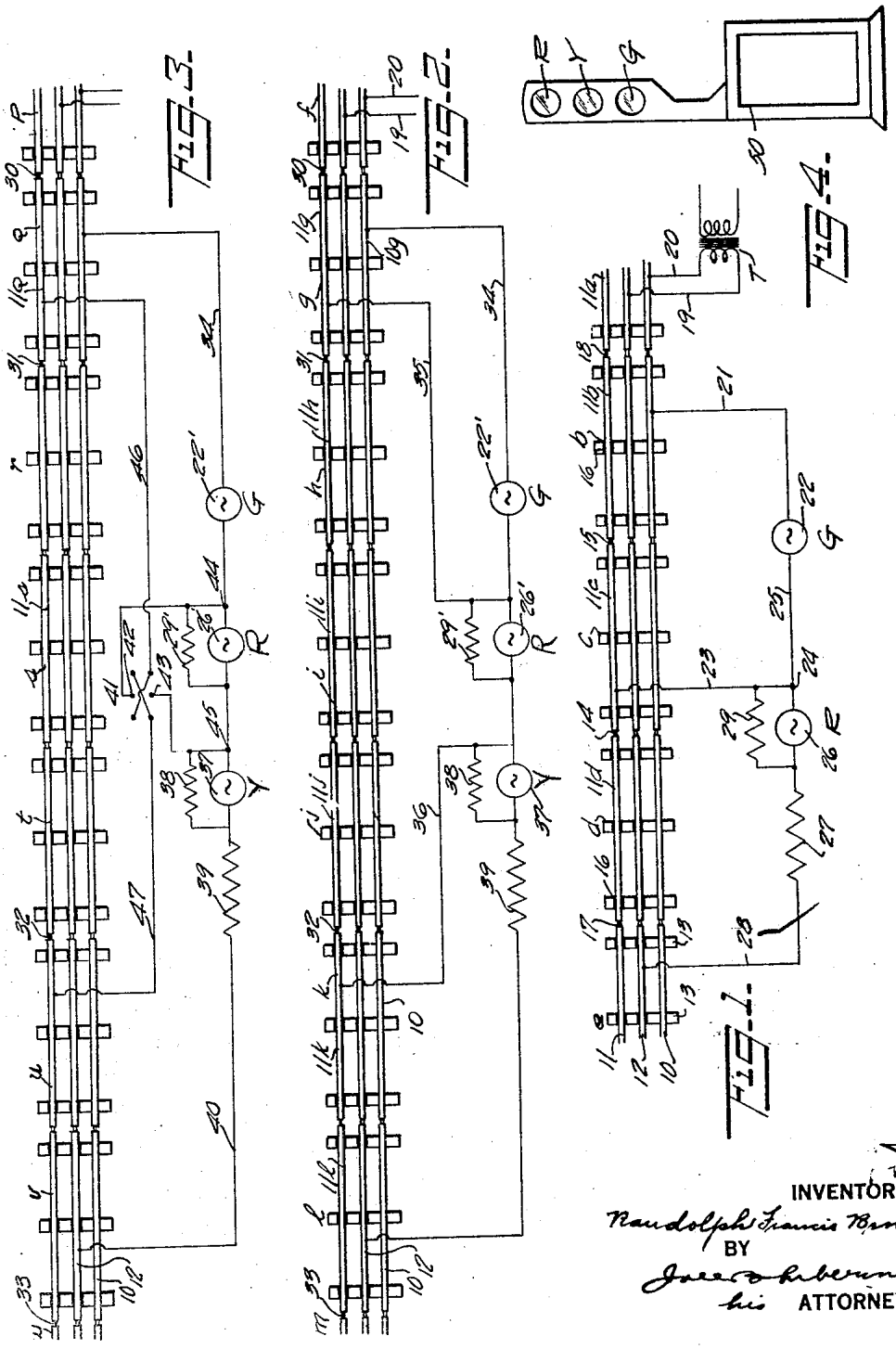

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BLOCK SYSTEM FOR TOY ELECTRIC RAILROADS.

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The present invention relates to block systems for toy electric railroads and is more particularly directed toward a signal system utilizing electric lamps to give various signals according to the position of the train on the track.

An object of the present invention is to provide a toy railroad signaling system, operated from the source of propulsion current, which gives lighted signals similar to the standard signals of main line railroads, without the use of moving parts.

In the convenient embodiments of the invention herein shown, two or more electric lamps of varying voltages, and associated resistances, are connected with the track lay-out. This lay-out utilizes a number of sections of toy track having at least one insulated track rail.

According to the present invention, the connections are made up and do not change during the operation of the train on the track. The lamps and resistances are so selected that the particular lamp to be lighted will depend upon the position of the train and the other lamp or lamps extinguished in the proper sequence.

In the accompanying drawing, there is shown, for purposes of illustrating the invention, three of the many possible embodiments in which it may take form, the drawing being diagrammatic, it being understood that the views are illustrative of the invention rather than limiting the same.

In these drawings:

Figure 1 is a diagrammatic view illustrating a track lay-out and circuit using two lamps for giving red and green indications only;

Figure 2 is a diagrammatic view of a track lay-out and connections illustrating three lamps such as red, yellow, and green, to be lighted in proper sequence during the movement of a train in one direction;

Figure 3 is a view similar to Figure 2, illustrating an arrangement for operating the three lamps in a proper sequence irrespective of the direction in which the train is operated; and

Figure 4 illustrates a form of signal tower which may be used in practising the present invention.

The drawing shows a fragment of a track lay-out; and for convenience, this is shown as being straight. The track lay-out is composed of a plurality of sections of a toy railroad track having two outside or wheel bearing rails, and a central or insulated third rail. All the rails are mounted on sleepers in the ordinary fashion, and the sections are connected together by insulated or metal pins as desired. As above indicated, each of these sections contains track rails 10 and 11, and a central or insulated third rail 12. These rails are mounted on the sleepers or cross ties 13 in the usual manner, the central rail in all instances being insulated from the cross ties, as indicated by the heavy lines where these insulations are located. In the description to follow, the sections are indicated by letters, and the particular part in the section by a reference character with an appropriate subscript.

The fragment of the system shown in Figure 1, utilizes five of these sections of track designated by *a*, *b*, *c*, *d* and *e*. The track rails 11^b, 11^c and 11^d are connected by conducting pins 14 and 15 and insulated from the sleepers or cross ties in the sections *b*, *c*, and *d* by insulations 16. Insulating pins 17 and 18 are used to align the rails 11^e, 11^d and 11^a, and 11^b respectively. Conducting pins interconnect the various sections of the insulated third rail 12, and similar pins connect the sections of the return or "grounded" track rail 10. This rail may be insulated from the sleepers or not, as desired.

The power supply which may be a transformer T, is connected to the central insulated third rail and one of the track rails in the usual manner, as indicated by the wires 19 and 20. It will be understood that these connections may be made at any convenient point along the track lay-out. A wire 21 connects any portion on the continuous track rail 10 to a lamp 22. A connection 23 is made from the insulated track rail 11 in the section *b*—*c*—*d* to a junction point 24 which is connected to the other side of the lamp 22 by a wire 25. A second lamp 26 is connected to the junction point 24 and also through a resistance 27 and a wire 28 to the central or third rail 12 at any convenient point. A resistance 28 is shown shunted about the lamp 26.

The lamp 22 is a high voltage lamp and is adapted to be lighted when the full potential of the propulsion current is applied to the circuit. This lamp is preferably colored green or placed back of a green color screen.

The lamp 26, however, is a low voltage lamp, and is preferably colored red or placed back of a red color screen.

Assuming that no train is on the track or that one is approaching from the left, it will be understood that the current flows from the supply wire 20 through the "grounded" part of the track circuit, thence through wire 21, lamp 22, wire 25, lamp 26 and by-pass 29, resistance 27, and wire 28 to the third rail 12. The resistances of the various parts of this circuit are so arranged that the lamp 22 is lighted and the lamp 26 is not lighted.

When the train passes beyond the insulating pin 18 to bring the trucks or running gear onto the track rails of sections *b*—*c*—*d*, the two track rails in these sections will come to the common potential and the trucks will shunt the lamp 22. The full potential of the power supply will then be applied by the leads 23 and 28 and this will cause sufficient current to flow through the low voltage lamp 26 to illuminate it. Hence it is obvious that the signal will show green when the train is not in the section *b*—*c*—*d*, but that when the train is in this section the signal will show red. The arrangement in this figure will operate the same, irrespective of the direction and motion of the train and the red lamp will be lighted so long as any portion of the train is on the track in section *b*—*c*—*d*.

In Figure 2, a modified form of track lay-out is indicated having sections *f*, *g*, *h*, *i*, *j*, *k*, *l* and *m*. Each of these sections has track rails, central rail, and sleepers, as previously described. As here shown, the track rails 11^g to 11^l, inclusive, are insulated from the cross ties or sleepers and this track rail is completely insulated into separate zones by insulating pins 30, 31, 32 and 33, so that this track rail is divided into three insulated zones.

The power wires 19 and 20 are connected as before to the two rails. A lamp 22′ similar to the lamp 22 is connected between the track rail 11^g and the continuous rail 10 by wires 34 and 35. A lamp 26′, shunted by resistance 29′, is connected to the lead at 35, and by means of lead 36 with the insulated track rail 11^k of section *k*. A third lamp 37 is shunted by a resistance 38 and is connected at one side to the lead 36 above referred to. The other side of the lamp is connected through a resistance 39 and wire 40 with the central insulated or third rail.

The lamp 22′ is arranged to give a green indication, the lamp 26′ a red indication, and the lamp 37, a yellow indication; and the lamps and resistances are so selected that the signal will indicate green, yellow and red for safety, caution, and danger, according to standard railroad practice.

Assuming that there is no train on the track or that it is standing outside of the special sections, it will be noted that the current flows from the continuous track rail 10 through lead 34, lamp 22′, lamp 26′ and by-pass 29′, lamp 37 and by-pass 38, resistance 39 and lead 40 to the third rail. The arrangement is such that the lamp 22′ lights and gives the green signal. Now assuming that the train has crossed into section *g*, the running gear of the train will shunt the lamp 22′ and impose the full potential of the power source onto the circuit including the lead 35, lamps 26′ and 37 and resistances 28′, 38, 29 and lead 40. This will impose sufficient potential on the intermediate voltage lamp so as to illuminate it and give the red danger signal. The signal will stay red as long as any of the cars of the train are on the section *g*. The sections *h*, *i* and *j*, of which there may be any desired number depending on the length of the train, will permit the train to pass beyond the red signal before crossing the insulating pin 32 and entering the next track zone, here shown as *k* and *l*. As soon as the locomotive wheels pass onto the section *k*, they will shunt the green and red lamps, as the running gear will stand on tracks 11^k and 10^k, the latter of which is connected through the lead 34 with the green lamp. The full potential will now be imposed on the circuit 36, 37, 38, 39 and 40, and the yellow lamp will be lighted. The yellow lamp will remain lighted as long as any of the train is in the sections *k* and *l*. When the train clears this zone by passing beyond insulating pin 33, the full potential is applied to the three lamps and the green lamp will light, showing that the train has cleared all the protected sections of track.

The system illustrated in Figure 3 is similar to the system shown in Figure 2, except that it is arranged to give the usual sequence of green, red, and yellow lights irrespective of the direction of train operation, a switch being included, which is shifted depending upon the direction of train movement. The fragment of the track lay-out is here composed of sections *p*, *q*, *r*, *s*, *t*, *u*, *v*, and *w*. The insulated pins 31, 30, 32, and 33 are placed the same as in Figure 2, and the leads 34, lamps 22′, 26′ and 37, and resistances 29′, 38 and 39 and lead 40 are also connected as before.

A double-pole double-throw reversing switch 41 has its central contacts 42 and 43 connected to the junction points 44 and 45, while the fixed contacts are connected to the insulated rails of sections *q* and *u*, by means of wires 46 and 47, as indicated.

Assuming that the switch 41 is thrown to the left, and that the train is proceeding to the left, the signal system will operate the same as above outlined in Figure 2. When the train is operated to the right, and

the switch is thrown to the right, the circuit connections will be changed so that the green lamp will be lighted when the train is not on the special sections of track and so that the red lamp will be lighted when the train is in sections *u* and *v* and will remain lighted until it clears section *u* and enters section *q*, when the yellow lamp will be lighted and the red extinguished.

Figure 4 illustrates a three light signal 50 in which the lamps may be mounted and to which the wires may be connected, as will be understood. These lamps may be mounted behind colored transparencies or if desired, the lamp bulbs themselves may be colored with appropriate coloring material, in which case there will be less likelihood of wrongly placing the lamps in the lamp sockets.

While the drawings have shown the wires as being directly connected to the rails, it will of course be understood that this is diagrammatic and that detachable or fixed connectors, such as are in common use in toy railroads, may be used for the purpose. The point at which the leads 21 and 34 are connected to the grounded rail is unimportant, and similarly the point at which the leads are connected to the third rail. In practice these two wires could be coupled to a single connector. The track rails 10 may be insulated from the sleepers or cross ties, if desired, or may be mounted on them without insulation. The zones or sections of track may be composed of any convenient number of interchangeable track sections. The number shown in the figures in the drawing is illustrative only. The sections of rail outside the special sections may have one or both rails of the track insulated from one another. The invention is not restricted for use on a single track lay-out, as it could readily be adapted for use in protecting a switch, crossing, or other special work.

It is obvious that the invention may be embodied in many forms and constructions, and I wish it to be understood that the particular forms shown are but a few of the many forms. Various modifications and changes being possible, I do not limit myself in any way with respect thereto.

I claim:

1. A toy railroad signal system comprising, a plurality of sections of three rail toy railroad track interconnected for train operation, each section having two track rails and a central insulated or third rail, certain special sections of track having one of the track rails thereof insulated from the other track rail and from the corresponding rail of adjacent sections, a power source connected to the third rail and to the said other track rail, and a plurality of signaling devices interconnected with one another with the central rail, the insulated track rail and the other track to give one indication when the track rails of said special sections are connected by the running gear of the train and another when the train is not in said section.

2. A toy railroad signal system comprising, a plurality of sections of three rail toy railroad track interconnected for train operation, each section having two track rails and a central insulated or third rail, certain special sections of track having one of the track rails thereof insulated from the other track rail and from the corresponding rail of adjacent sections, a power source connected to the third rail and to the said other track rail, and two electric lamps arranged in series and connected between the central rail and the said other track rail, and a connection from the insulated track rail to a common point between the lamps.

3. A toy railroad signal system comprising, a plurality of sections of three rail toy railroad track interconnected for train operation, each section having two track rails and a central insulated or third rail, certain special sections of track having one of the track rails thereof insulated from the other track rail and from the corresponding rail of adjacent sections, a power source connected to the third rail and to the said other track rail, a high voltage lamp and a low voltage lamp connected in series between the central rail and the said other track rail, a resistance shunted around the low voltage lamp, and a connection between the insulated track rail and a common point between the lamps.

4. A toy railroad signal system comprising, a plurality of sections of three rail toy railroad track interconnected for train operation, each section having two track rails and a central insulated or third rail, certain special sections of track having one of the track rails thereof insulated from the other track rail and from the corresponding rail of adjacent sections, a power source connected to the third rail and to the said other track rail, and two lamps of different voltages so interconnected with the rails that one lamp is lighted when there is no train on the special section of track, and such that said lamp is extinguished and the other lamp is lighted when the train is on the said section.

5. The combination with a toy railroad track lay-out composed of a plurality of track sections, each having a pair of track rails and an insulated central rail, certain special sections of said track having a track rail which is insulated from the other track rail and which is insulated from the adjacent rails of adjoining sections, and a toy train having trucks adapted to electrically connect the track rails, of a plurality of lamps interconnected with the central rail, the insulated

track rail and the other track rails so that only one of the lamps is lighted when the truck is off the special sections and the other lamp is lighted when the truck is on said special sections.

6. The combination with a toy railroad track lay-out composed of a plurality of track sections, each having a pair of track rails and an insulated central rail, certain special sections of said track having a track rail which is insulated from the other track rail and which is insulated from the adjacent rails of adjoining sections, and a toy train having trucks adapted to electrically connect the track rails, of a plurality of lamps of different voltages interconnected with the central rail, the insulated track rail and the other track rail so that the higher voltage lamp is lighted when the truck is off the special sections and the other lamp is lighted when the truck is on said special sections.

7. The combination with a toy railroad track lay-out composed of a plurality of track sections, each having a pair of track rails and an insulated central rail, certain special sections of said track having a track rail which is insulated from the other track rail and which is insulated from the adjacent rails of adjoining sections, and a toy train having trucks adapted to electrically connect the track rails, of a plurality of lamps of different voltages interconnected with the central rail, the insulated track rail and the other track rail so that the higher voltage lamp is lighted when the truck is off the special sections and the other lamp is lighted when the truck is on said special sections, said lamps being in series.

8. The combination with a toy railroad track lay-out composed of a plurality of track sections, each having a pair of track rails and an insulated central rail, certain special sections of said track having a track rail which is insulated from the other track rail and which is insulated from the adjacent rails of adjoining sections, and a toy train having trucks adapted to electrically connect the track rails, of a plurality of lamps of different voltages interconnected with the central rail, the insulated track rail and the other track rail so that the higher voltage lamp is lighted when the truck is off the special sections and the other lamp is lighted when the truck is on said special sections, said lamps being in series, there being a resistance in circuit with the lower voltage lamp so that the full potential of the power source is not applied to it.

9. The combination with a toy railroad track lay-out composed of a plurality of track sections, each having a pair of track rails and an insulated central rail, certain special sections of said track having a track rail which is insulated from the other track rail and which is insulated from the adjacent rails of adjoining sections, and a toy train having trucks adapted to electrically connect the track rails, of a plurality of lamps of different voltages interconnected with the central rail, the insulated track rail and the other track rail so that the higher voltage lamp is lighted when the truck is off the special sections and the other lamp is lighted when the truck is on said special sections, said lamps being in series, there being a resistance in circuit with the lower voltage lamp so that the full potential of the power source is not applied to it, and a resistance in shunt with the low voltage lamp.

10. The combination with a toy railroad track lay-out composed of a plurality of track sections, each having a pair of track rails and an insulated central rail, certain special sections of said track having a track rail which is insulated from the other track rail and from the adjacent rails of adjoining sections, said insulated track rail being further divided into zones insulated from one another, a power source connected to the central rail and said other track rail, and a toy train having trucks adapted to electrically connect the track rails, of a plurality of lamps interconnected with the central rail, the insulated track rails in said zones and to the other track rail so that only one of the lamps is lighted when the trucks are off all said special sections, so that another lamp is lighted when the trucks are in one zone, and so that the third lamp is lighted when the trucks are in another zone.

11. The combination with a toy railroad track lay-out composed of a plurality of track sections, each having a pair of track rails and an insulated central rail, certain special sections of said track having a track rail which is insulated from the other track rail and from the adjacent rails of adjoining sections, said insulated track rail being further divided into zones insulated from one another, a power source connected to the central rail and said other track rail, and toy train having trucks adapted to electrically connect the track rails, of a plurality of lamps of different voltages interconnected with the central rail, the insulated track rails in said zones and to the other track rail so that the highest voltage lamp is lighted when the trucks are off all said special sections, so that the intermediate voltage lamp is lighted when the trucks are in one zone, and so that the lowest voltage lamp is lighted when the trucks are in another zone.

12. The combination with a toy railroad track layout composed of a plurality of track sections, each having a pair of track rails and an insulated central rail, certain special sections of said track having a track rail which is insulated from the other track

rail and from the adjacent rails of adjoining sections, said insulated track rails being further divided into zones insulated from one another, a power source connected to the central rail and said other track rail, and a toy train having trucks adapted to electrically connect the track rails, of a plurality of lamps of different voltages interconnected with the central rail, the insulated track rails in said zones and to the other track rail so that the highest voltage lamp is lighted when the trucks are off all said special sections, so that the intermediate voltage lamp is lighted when the trucks are in one zone, and so that the lowest voltage lamp is lighted when the trucks are in another zone, said lamps being arranged in series.

13. The combination with a toy railroad track lay-out composed of a plurality of track sections, each having a pair of track rails and an insulated central rail, certain special sections of said track having a track rail which is insulated from the other track rail and from the adjacent rails of adjoining sections, said insulated track rail being further divided into zones insulated from one another, a power source connected to the central rail and said other track rail, and toy train having trucks adapted to electrically connect the track rails, of a plurality of lamps of different voltages interconnected with the central rail, the insulated track rails in said zones and to the other track rail so that the highest voltage lamp is lighted when the trucks are off all said special sections, so that the intermediate voltage lamp is lighted when the trucks are in one zone, and so that the lowest voltage lamp is lighted when the trucks are in another zone, said lamps being arranged in series, the two lower voltage lamps being shunted by resistances, and a resistance in series with the lowest voltage lamp.

14. In a signaling system for toy electric railroads, a resistance and a plurality of lamps of differing voltages connected in series between the third rail and the grounded return rail, the resistance being between the third rail and the lower voltage lamp, the higher voltage lamp being lighted when propulsion current is applied to the track, and a connection from an insulated section of the other track rail to a point between the lamps so that the higher voltage lamp is shunted by the trucks of the toy train and the potential is applied to the lower voltage lamp which is protected by the series resistance.

Signed at New York, in the county of New York and State of New York, this 8 day of March, 1926.

RANDOLPH FRANCIS BRONSON.