Patented Feb. 12, 1924. 1,483,065

UNITED STATES PATENT OFFICE.

ANDREW R. ANDERSON, OF NORTH ARLINGTON, NEW JERSEY; ARTHUR R. ANDERSON EXECUTOR OF SAID ANDREW R. ANDERSON, DECEASED.

SHOE TREE.

Application filed January 27, 1922. Serial No. 532,185.

To all whom it may concern:

Be it known that I, ANDREW R. ANDERSON, a citizen of the United States, residing at North Arlington, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Shoe Trees, of which the following is a specification.

This invention relates to improvements in shoe trees of that type comprising relatively displaceable toe sections or halves, a heel member, and means for relatively separating said toe sections to stretch the shoe within which the last is arranged.

One of the primary objects of the present invention is to provide a last of the type above referred to which will be capable of a wide range of adjustment thus adapting it for use in shoes of a number of different sizes.

Another object of the invention is to provide a novel form of connection between the shanks which are associated with the heel member and with the expansible toe of the last, the connection being of such nature as to provide for a positive locking of the parts against accidental disarrangement after the last has been properly adjusted and placed within the shoe to be stretched and retained in shape.

Another object of the invention is to so construct the connection referred to above that the same will be devoid of pivoted latch members or similar locking devices of a more or less frail nature liable to become distorted, disarranged, or damaged.

In the accompanying drawings:

Figure 1 is a perspective view of a last constructed in accordance with the present invention;

Figure 2 is a horizontal sectional view in detail through the shank members of the last and the connection provided between said members;

Figure 3 is a bottom plan view of the connection and the end portions of the shank members associated therewith; and

Figure 4 is a detail transverse sectional view on the line 4—4 of Figure 2 looking in the direction indicated by the arrows.

The last embodying the invention includes a toe indicated in general by the numeral 1 and a heel indicated by the numeral 2, these parts being connected, in accordance with the invention, in a manner which will presently be described. The heel 2 is preferably in the nature of a knob, as is usual in devices of this class, and the toe 1 comprises a pair of sections or halves so connected that they may be relatively separated and may adapt themselves to the toe portion of the shoe within which they are fitted, in the use of the last. The connections between the toe sections which are indicated by the numeral 3, include a plate 4 having relatively angularly disposed slots 5, receiving pins 6 carried by the toe sections 3, the plate being disposed between the sections as shown in Figure 1, as is customary, and being adapted, when slid forwardly, to thrust the sections apart thus expanding the toe as a unit and causing the same to fill and stretch the toe portion of the shoe. The movement of the expanding member 4 is effected by an angular displacement of shank members which extend between the said plate and the heel 2. These shank members are indicated one by the numeral 7 and the other by the numeral 8 and the member 7 is pivotally connected at its forward end as at 9 to the plate 4 whereas the member 8 is secured at its rear end to or in the knob comprising the heel member 2.

The connecting means between the shanks 7 and 8 is indicated in general by the numeral 10, and the same comprises a substantially rectangular sleeve including sides 11, a top 12, and a bottom 13. Interiorly the sleeve is of a width slightly greater than the combined thickness of the shank members 7 and 8, and the said members at their relatively adjacent ends, are arranged in overlapped relation within the sleeve, the member 7 being pivotally connected as at 14 at its rear end to the inner side of one wall 11 of the sleeve 10. The shank member 8 is capable of being slidably adjusted through the sleeve so as to lengthen or shorten the connection as a whole, but it is incapable of the pivotal movement which may be had between the sleeve and the shank member 7. In order to permit of such pivotal movement of the said shank member and sleeve, the sleeve is formed in its bottom wall 13 with a notch extending longitudinally inwardly from its end, this notch being designed to accommodate the pivoted end of the shank member 7 when the said end of the member is swung upwardly. Pivotal movement of the shank member 7 with rela-

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A. R. ANGUS

RAILWAY SAFE RUNNING DEVICE

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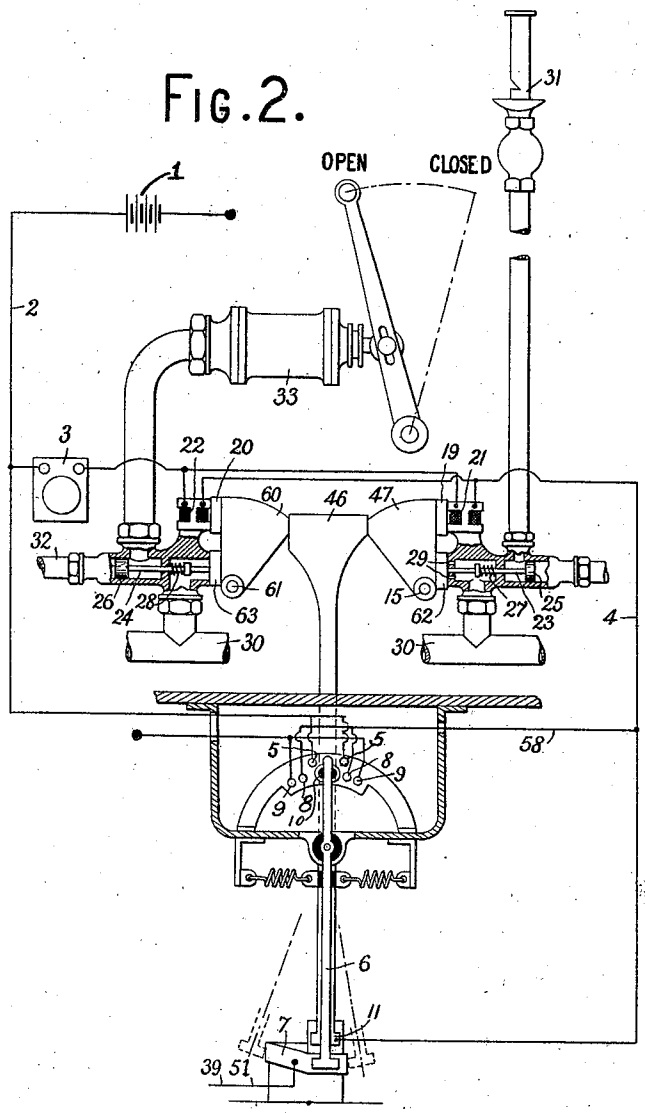
FIG. 2.



WITNESSES

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BY

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Feb. 12 , 1924. 1,483,066

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RAILWAY SAFE RUNNING DEVICE

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FIG.3A.

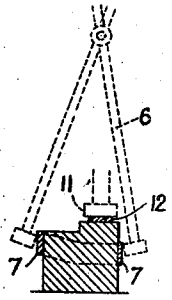


FIG.3.

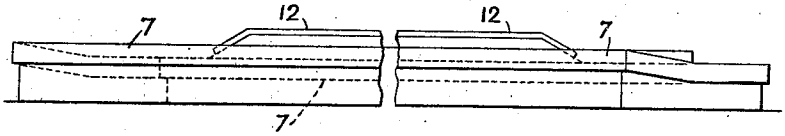


FIG.4A.

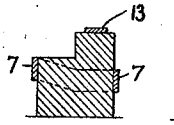


FIG.4.

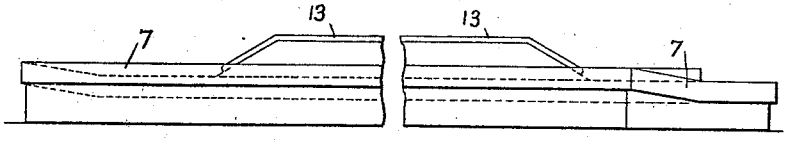


FIG.5.

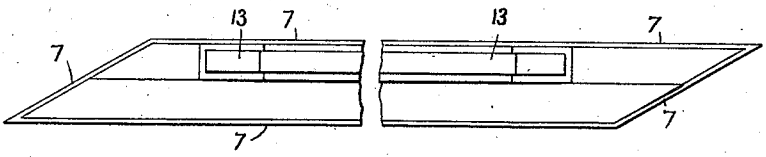
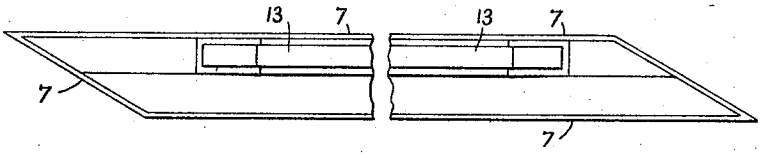


FIG.6.



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RAILWAY SAFE RUNNING DEVICE

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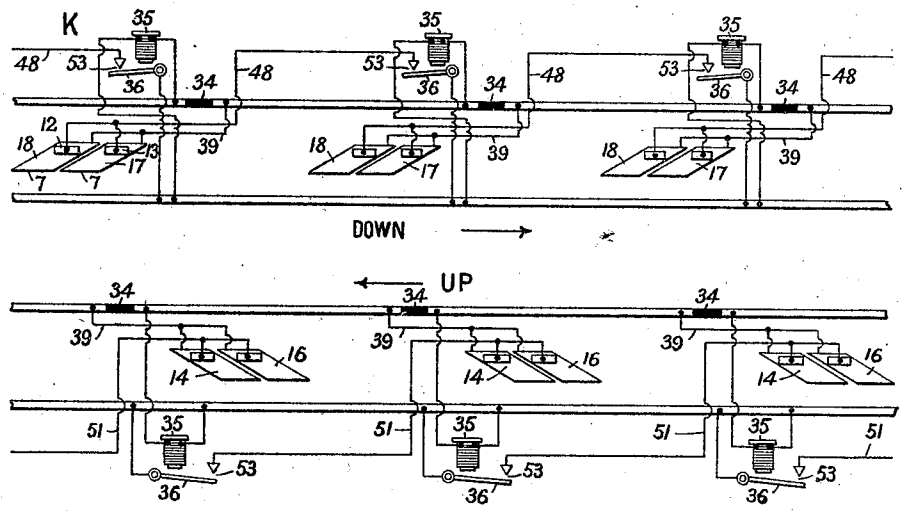
FIG. 7.



WITNESSES

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UNITED STATES PATENT OFFICE.

ARTHUR REGINALD ANGUS, OF MINEHEAD, ENGLAND.

RAILWAY SAFE-RUNNING DEVICE.

Application filed October 1, 1913. Serial No. 792,706.

(GRANTED UNDER THE PROVISIONS OF THE ACT OF MARCH 3, 1921, 41 STAT. L., 1313.)

To all whom it may concern:

Be it known that I, ARTHUR REGINALD ANGUS, of Glenmore House, Glenmore Road, Minehead, in the county of Somerset, England, solicitor, have invented a certain new and useful invention entitled Improvements in or Relating to Railway Safe-Running Devices, of which the following is a specification.

This invention relates to train controlling apparatus and comprises the various features defined in the claims appended hereto.

The invention is illustrated by the accompanying drawings which represent by way of example apparatus constructed and arranged in accordance therewith.

Figs. 1 to 6 inclusive show apparatus suitable for a single line where trains run in either direction.

Fig. 7 shows track apparatus suitable for use on a double line where trains usually run in the same direction on the same track.

Fig. 1 shows a stretch of single track adapted according to these improvements for trains running in either direction.

Fig. 2 shows one type of train apparatus which may be used in connection with apparatus as shown in Figs. 1 or 7.

Figs. 3 and 3^a show respectively in side elevation and in cross section a compound track contact such as would be used in conjunction with the apparatus shown in Figs. 1, 2, and 7 for producing a warning operation on a train.

Figs. 4 and 4^a show respectively in side elevation and in cross section a similar compound track contact for producing a stopping operation on a train.

Fig. 5 is a plan of Fig. 4.

Fig. 6 shows a variation of Figure 5.

Fig. 7 shows a stretch of double track adapted for use with a locomotive equipped as in Fig. 2.

In the apparatus used in connection with single lines as shown in Figs. 1 to 6 inclusive there are arranged on or about the railway tracks what may be termed compound track contacts 14, 16, 17 and 18 (Fig. 1). Each of the compound contacts shown has a base of some suitable material as wood and has a top contact plate 12 or 13 and side contact plates 7 preferably arranged around the base as shown.

All the compound track contacts are so arranged that a line drawn through their centres would lie to one side of and be parallel to a line drawn centrally of the track and parallel to the track rails; in this way the side contacts 7 (Figs. 3^a, 4^a, 5 and 6) are adapted so as to effect the turning of a contacting device 6 (Fig. 2) into the positions shown dotted when it will either contact with a contact 5 or connect together, by means of a contact plate 10 carried by but insulated from the shoe 6, a pair of contacts 8 and 9.

The contacts 5, 8, and 9 of the locomotive apparatus are duplicated as shown in Fig. 2 for the purpose of enabling the apparatus of a train which has been turned on a turntable, triangle, loop, or the like to interact correctly with the track apparatus.

The contacts 7 are of the shape shown in the figures so as to turn the contacting device without shock or jar and may be so arranged that the contacting device 6 is always turned to one of the dotted positions shown in Figure 2 before the shoe 11 (Fig. 2) of another contacting device interacts with top contacts 12 or 13 so as to tend to produce warning and stopping operations respectively on the train.

If desired the top contacts 12 and 13 may be placed external to the contact 7 and contacts 7 and 12 or 13 may be placed outside the railway tracks instead of within as shown in Figure 1.

The contact 13 which is adapted to cause a stopping operation preferably effects a greater displacement of the shoe 11 than the contact 12 which is adapted to produce a warning operation.

The shoe 11 Fig. 2 is attached to but insulated from any suitable vehicle such as a locomotive or brakevan and is adapted to be differently displaced when interacting with track contacts such as 12 or 13 placed on or about the railway tracks and when not in interaction with these track contacts may be returned to its lowest or normal position by a spring acting on it in addition to gravity though it may be held in normal position by one or more springs or by gravity only.

The part 46 of the shoe 11 is so shaped and adapted as to restrain mechanically or hold in their normal position sector shaped pieces 47 and 60 pivoted at 15 and 61 respectively.

To the sectors 47 and 60 are attached doors or the like 62 and 63 and armatures 19 and 20 respectively. These armatures 19 and 20 pertain respectively to electromagnets 21 and 22. Against the doors 62 and 63 press piston rods 23 and 24 behind the pistons of which 25 and 26 is suitable fluid pressure as that of steam, air or gas tending to move or push out the pistons 25 and 26 and in addition there are springs 27 and 28 also tending to push out the piston rods 23 and 24 and thus open the doors 62 and 63.

In addition to these forces acting on the doors and tending to open them there is also the weight of the sectors which would alone be sufficient to cause them to fall or be moved unless restrained by some part such as 46 of the shoe 11. The shoe 11 is so arranged that if it becomes displaced from its normal position its relative doors or sectors will be moved so as to produce on the train a warning or a stopping operation or both.

The operation of this apparatus has been already described in the specification of my United States patent numbered 1,207,676 and need not be fully described but briefly it is as follows:—

When the locomotive interacts with a warning track contact 12 the shoe 11 is lifted or moved to such an extent that the part 46 is moved clear of the sector 47 which unless otherwise restrained by its armature 19 being attracted by the energization of the electromagnet 21 will at once fall being pushed out by the piston rod 23 through the influence of the spring 27 and the fluid pressure behind the piston 25.

The train pipe 30 will thus be connected to atmosphere through the small orifices 29 and a service application of the brakes effected and the danger whistle 31 will be blown.

When the locomotive interacts with a stopping track contact 13 the shoe 11 is displaced to a greater extent so that the part 46 is lifted clear of both sectors 47 and 60 which unless otherwise restrained by current passing through the electromagnets 21 and 22 will at once fall and in addition to the danger whistle 31 sounding the train pipe 30 will be connected directly to atmosphere resulting in an emergency application of the brakes and fluid pressure will be admitted from the pipe 32 to the cylinder 33 thus forcing over the driver's handle to the shut or closed position.

These operations will be performed when a locomotive interacts with track contacts and no current passes through the coils of electromagnets 21 and 22 or not sufficient current to hold their armatures 19 and 20.

The sectors 47 and 60 may be returned to their normal positions as shown in the drawings by suitable levers (not shown) and means may be provided for preventing the driver from restarting the train if it has been automatically stopped by the track contact. For example the lever for restoring the sector 60 may be kept in a locked box the key of which is in the possession of the guard or some other official.

The lever mechanism suitable for returning the sectors to their normal positions is described and illustrated in the specification and drawings of my United States patent numbered 1,415,214.

In order to prevent these warning and stopping operations from being effected sufficient current must flow through the coils of electromagnets 21 and 22 and the sectors 47 and 60 will then be maintained in their normal positions as shown and neither the warning nor the stopping operation will be performed.

This will be the case when a train on the down journey interacts with track contacts 18 and 17 (of which 18 is a warning contact and 17 a stopping track contact) at "A" (Fig. 1) and the two sections ahead of it namely: B, C, and D, E, are unoccupied. The rails are bonded and the track is divided up into sections by insulating joints 34 and at one end of each section a track relay 35 is connected across the rails.

These are normally not energized and their armatures 36 are thus not attracted. The insulated rail at the other end of the section is connected to the contacts 7 of the compound track contacts 18, 17 and 14, 16 through quick acting electromagnets 37 and 38.

A train on the down journey however interacting with the track contacts 18, 17 at A, current will flow from the generator 1 (Figure 2) wire 2 to contact 5 shoe 6 (the track contacts at A being of the shape shown in Figure 5 and therefore turning shoe 6, into contact with contact 5) to contact 7 of the compound track contacts 18 or 17 wire 39 the coils of quick acting electromagnet 37 wire 40 along the insulated rail of section B, C, to the coils of the track relay 35 and back to the generator 1 by the other bonded but uninsulated rail and the frame of the locomotive.

The armature 41 of the magnet 37 is thus attracted and completes a parallel path from wire 39 through contact 42 wire 43 wire 44 along the insulated and bonded rail of section D, E, to the coils of track relay 35 of section D, E, and back to the generator 1 by the other rail and the frame of the locomotive.

The track relays of the sections B, C, and D, E, are thus both energized and their armatures attracted thereby completing another circuit from the generator 1 by wire 2 bell or buzzer 3 electromagnets 22 and 21

wire 4 shoe 11 the top contacts 12 or 13 of the compound track contacts 18 and 17 wire 48 branch wire 49 insulated contacts 50 of the track relay of section B, C, wire 52 contact 53 armature 36 of the track relay of section D, E, to the bonded but uninsulated rail and back to the generator 1 by the wheels and frame of the locomotive. The electromagnets 21 and 22 are thus energized the sectors 47 and 60 maintained in their normal position as shown the line clear bell or buzzer 3 sounds warning and stopping operations are restrained and the train obtains clearance.

But if either of the sections B, C, or D, E, had been occupied by any vehicle the track relay 35 of that particular section would have been shunted and the circuit of the top contacts 12 and 13 to the rail would not have been completed and thus the train would have been warned on contact 18 and stopped on track contact 17.

The distance of the track contact 17 and also track contact 14 from the adjacent insulated joint 34 is such as to enable a train to be stopped before entering the next section.

A train running on the up journey and interacting with the compound track contacts 16 and 14 at F will energize the track relays 35 of sections D, E, and B, C, through the wire 152 the coils of electromagnet 38 wires 56 and 44 also armature 55 contact 54 and wires 57 and 40 if the sections are unoccupied thus completing the circuit of the top contacts 12 and 13 through wires 51 and 49 contacts 50 wire 52 contact 53 and armature 36 and enabling the train to obtain clearance.

But should either of the sections D, E, or B, C, be occupied this circuit will not be completed and the train will be warned on compound track contact 16 and stopped on compound track contact 14.

When a down train interacts with the track contacts at B, D, F, etc., which are of the shape shown in Figure 6 its contacting shoe 6 is turned in the sense opposite to that in which it was turned by contacts 18 and 17 and to the greater extent necessary to enable the shoe 6, by means of the contact plate 10 carried by but insulated from the shoe 6, to connect together the contacts 8 and 9 towards which the upper end of the shoe 6 is thus turned, the turning of the shoe 6 being effected in consequence of the direction of inclination of the first-encountered faces of the track contacts 14 and 16 and of the distance of their right-hand (with resect to the direction of travel of the train) faces from a line drawn centrally of the track. A local circuit is then completed from the generator 1 wire 2 bell or buzzer 3 coils of electromagnets 21 and 22 wire 4 branch wire 58 through contacts 8 and 9 to the frame and the train thus obtains clearance irrespective of whether the two sections immediately behind it are occupied or not otherwise the train running on the down journey interacting with these track contacts at B, D, F, etc., would be stopped by a following train on either of the two sections in its rear and this is not desirable. This similarly applies to an up train interacting with the track contacts at A, C, E, etc.

Any switch or switches operated either by a signalman or controlled by the movement of a signal arm or point detector may if desired be inserted in any circuit to break the circuit and so prevent a train entering a section and any resistances may also be inserted in any circuit.

On a single line therefore where trains run in either direction the two sections ahead of a train whether running on the up or down journey must be clear to enable it to obtain clearance. It is necessary to detect two sections ahead in this case as a down train might have obtained clearance over the track contacts say at "A" and be somewhere between these track contacts and the adjacent insulating joint 34 when a train on the up journey interacting with the track contacts at "F" would also obtain clearance as the down train had not yet entered section B, C. Both trains therefore are stopped at C and D and a collision is prevented which would have occurred had only one section ahead been detected.

It will be seen in Figure 2 that should the wire 4 short circuit to the frame the electromagnets 21 and 22 would receive normal current and the train would always obtain clearance over the track contacts.

The bell or buzzer 3 however would continue sounding and this continuous ringing would serve as an indication that a short circuit had occurrel. But should this not be deemed sufficiently satisfactory a relay with an overload attachment may be fitted to the locomotive and resistances R inserted in the connections of the track relays 35 to the uninsulated rail. For example see Figure 9 of the drawings accompanying the specification of my United States Patent numbered 1,207,676.

Figure 7 shows the method of equipping double tracks where trains usually run in the same direction on each track.

As before compound track contacts 18 and 17 are placed on or about the down line and compound track contacts 14 and 16 on the up line. The rails are also bonded and one of them divided up into sections by insulating joints 34. Track relays 35 with their armatures 36 are connected across one end of each section and the insulated rail at the other end of the section is connected directly to the contacts 7 of the compound track contacts. The train on the down line

interacting with the track contacts at K completes the circuit of the generator 1 through wire 2 contact 5 shoe 6 contact 7 wire 39 along the insulated bonded rail to the coils of the track relay 35 and back by the other rail and the frame of the locomotive thus energizing the track relay 35 and attracting its armature 36. The circuit of the coils 21 and 22 is thus completed from generator 1 wire 2 bell or buzzer 3 coils of electromagnets 21 and 22 wire 4 shoe 11 top contacts 12 or 13 wire 48 contact 53 armature 36 to the rail and back by the frame of the locomotive and the train obtains clearance. Should the section however have been occupied the track relay 35 will not be energized its armature 36 not attracted and the train will be warned on track contact 18 and stopped on track contact 17. As before the distance of the compound track contacts 17 and 14 from the adjacent insulating joints 34 is equal to the maximum braking distance of the heaviest train plus a percentage. The operation is similar for the up line and it is evident that if desired a train may run on the up direction on the down line and vice versa its contacting shoe 6 being then turned so as to bring the contact plate 10 into contact with the contacts 8 and 9, thus giving the train clearance.

It will be noticed that for double lines only one section ahead is detected and the use of quick acting electromagnets 37 and 38 as in Figure 1 is obviated.

Each train should be equipped with some suitable known type of continuous automatic brakes.

What I claim and desire to secure by Letters Patent of the United States is:—

1. A train protecting device comprising a bonded track having one of the rails divided into insulated sections, a normally de-energized testing relay connected across the rails at one end of each section and adapted to control current paths, track contacts pertaining to the other end of each of said sections and located appropriately for controlling admission thereto and connected to said current paths respectively, other track contacts pertaining to each of said sections respectively, electrically controlled train means including warning and stopping means, a vertically displaceable train contact coacting with the first mentioned track contacts, and a laterally displaceable train contact co-acting with the second mentioned track contacts, said train means being designed to energize the testing relays and pass a current of predetermined value through the train means to restrain the warning and stopping means when the track is clear.

2. A train protecting device comprising a bonded track having one of the rails divided into insulated sections, a normally de-energized testing relay connected across the rails at one end of each section and adapted to control current paths, track members pertaining to the other end of each of said sections and located appropriately for controlling admission thereto and connected to said current paths respectively, apparatus on a train including electro-magnetically controlled warning and stopping means co-operating with the track members, and means for preventing the warning and stopping means from being actuated when said train is traveling away from an occupied section comprising a laterally displaceable train contact coacting with the track members and designed to complete a local circuit on the train and energize the magnets restraining the warning and stopping means.

3. A train protecting device comprising a bonded track having one of the rails divided into insulated sections, a normally de-energized testing relay connected across the rails at one end of each section, track members having top and side contacts and pertaining to the other end of each of said sections and located appropriately for controlling admission thereto, quick-acting relays on the track connected between said side contacts and said insulated rail sections and adapted when energized to close current paths through corresponding testing relays, means for connecting said top contacts to the armatures of said testing relays when said testing relays are energized and thus completing current paths through said top contacts, train means including electrically controlled warning and stopping means co-operating with the track members and designed to energize said quick-acting relays and consequently said testing relays, by way of said side contacts and to pass a current of predetermined value through said top contacts and said train means to restrain the warning and stopping means when the track is clear.

4. Electrical train-controlling apparatus comprising a generator of electricity, apparatus carried by a train including an electro-responsive device whose movable portion is adapted to occupy a line-clear position and a danger position according to two conditions as to electrification of said electro-responsive device, a track portion composed of two adjacent track sections separated from each other by insulation, a track member for controlling admission into the said track portion, for the two sections respectively and connected to the rails of the sections to which they respectively pertain two testing relays one of which is adapted to be included in circuit with said generator of electricity on contact of said train with said track member, and a quick-acting relay connected to said track member and adapted to be energized on contact of said train with

said track member and when so energized to cause its movable part to connect the other of said testing relays into circuit with said generator of electricity, each of said testing relays being adapted to be short-circuited by the presence of a train on the section to which it pertains and when so short-circuited to prevent said electro-responsive device on said train from assuming a line-clear condition as to electrification on contact of said train with said track member.

5. Electrical train-controlling apparatus comprising on the track traffic-controlling means, a track member for enabling trains to interact with said traffic-controlling means, and on a train a danger-indicating device constantly tending to assume a danger position, restraining means for normally restraining the operation of said danger-indicating device, means for removing the restraint of said restraining means when said train is in contact with said track member, an electromagnetic restraining device adapted when energized to restrain the operation of said danger-indicating device, and a contacting device adapted to come into contact with said track member, and to be, by said track member, when said train is travelling in one direction, caused to occupy one position such as to enable it to co-operate with said traffic-controlling means, only if said traffic-controlling means be in its line-clear condition, in including electrically in circuit, and so causing the energization of, said electromagnetic restraining device, and to be, when said train is travelling in the opposite direction, caused to occupy another position such as to enable it to include electrically in circuit, and so cause the energization of, said electromagnetic restraining device, independently of said traffic-controlling means.

6. Electrical train-controlling apparatus comprising on the track two track members for the two directions of travel respectively and two sets of traffic-controlling means adapted for the protection of trains travelling in opposite directions respectively and connected with said track members respectively, and on a train a danger-indicating device constantly tending to assume a danger position, restraining means for normally restraining the operation of said danger-indicating device, means for removing the restraint of said restraining means when said train is in contact with either of said track members, an electromagnetic restraining device adapted when energized to restrain the operation of said danger-indicating device, and a contacting device adapted to come into contact with both of said track members and, owing to the configuration of said track members and their disposition in relation to the track, to be, when said train is travelling in one direction, caused by one of said track members to occupy a position such as to enable it to co-operate with the corresponding set of traffic-controlling means, only if that set of traffic-controlling means be in its line-clear condition, in including electrically in circuit, and so causing the energization of, said electromagnetic restraining device and by the other of said track members to occupy a position such as to enable it to include electrically in circuit, and so to cause the energization of, said electromagnetic restraining device independently of said sets of traffic-controlling means, and, when said train is travelling in the opposite direction, caused by the last mentioned track member to occupy a position such as to enable it to co-operate with the corresponding set of traffic-controlling means, only if that set of traffic-controlling means be in its line-clear condition, in including electrically in circuit, and so causing the energization of, said electromagnetic restraining device and by the other of said track members to occupy a position such as to enable it to include electrically in circuit, and so to cause the energization of, said electromagnetic restraining device independently of said sets of traffic-controlling means.

7. Electrical train-controlling apparatus comprising on the track two track members for the two directions of travel respectively and two sets of traffic-controlling means adapted for the protection of trains travelling in opposite directions respectively and connected with said track members respectively, and on a train a danger-indicating device constantly tending to assume a danger position, restraining means for normally restraining the operation of said danger-indicating device, means for removing the restraint of said restraining means when said train is in contact with either of said track members, an electromagnetic restraining device adapted when energized to restrain the operation of said danger-indicating device, and a contacting device carried by the locomotive of said train and adapted to come into contact with both of said track members and, owing to the configuration of said track members and their disposition in relation to the track, to be, when said train is travelling in one direction and the locomotive faces in either direction, caused by one of said track members to occupy according to the facing of the locomotive one or the other of two positions on opposite sides of and at equal distances from its normal position and thereby caused to co-operate with the corresponding set of traffic-controlling means, only if that set of traffic-controlling means be in its line-clear condition, in including electrically in circuit, and so causing the energization of, said electromagnetic restraining device, and, by the other of said track

members to occupy according to the facing of the locomotive one or the other of two positions on opposite sides of its normal position and at distances therefrom equal to each other but unequal to the aforesaid distances and thereby to include electrically in circuit, and so to energize, said electromagnetic restraining device independently of said sets of traffic-controlling means, and to be, when said train is travelling in the opposite direction and the locomotive faces in either direction, caused by the last mentioned track member to occupy according to the facing of the locomotive one or the other of the former two positions and by the other track member to occupy according to the facing of the locomotive one or the other of the latter two positions.

Dated the seventeenth day of September, one thousand nine hundred and thirteen.

ARTHUR REGINALD ANGUS.

Witnesses:

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