J. G. BRINSON.

TRAIN STOP.

APPLICATION FILED JULY 14, 1913.

1,152,283.

Patented Aug. 31, 1915.

4 SHEETS—SHEET 1.

Fig. 1.

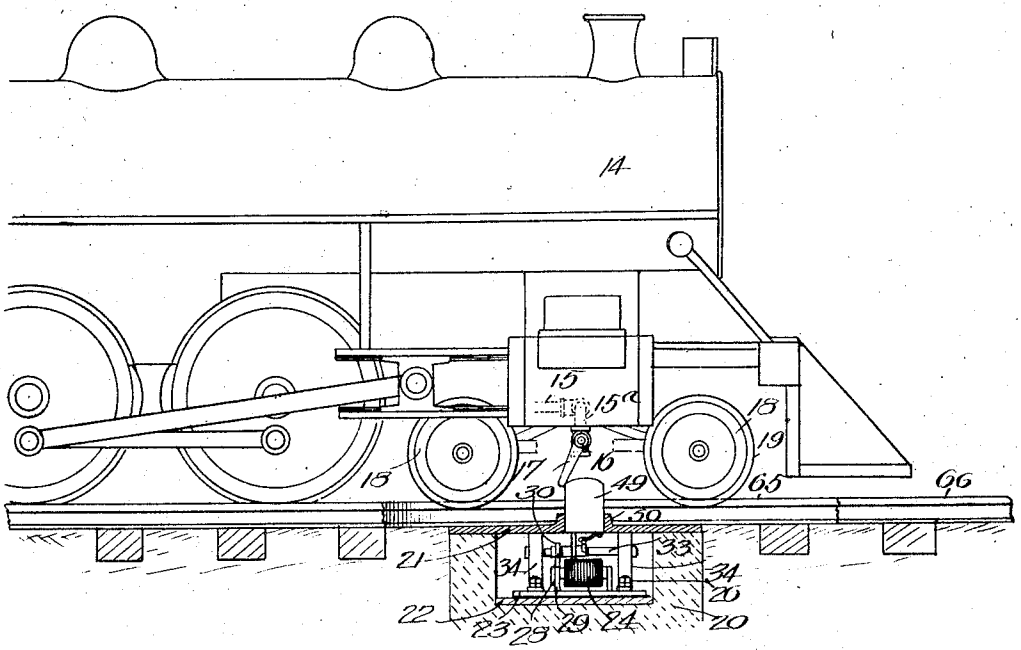


Fig. 2.

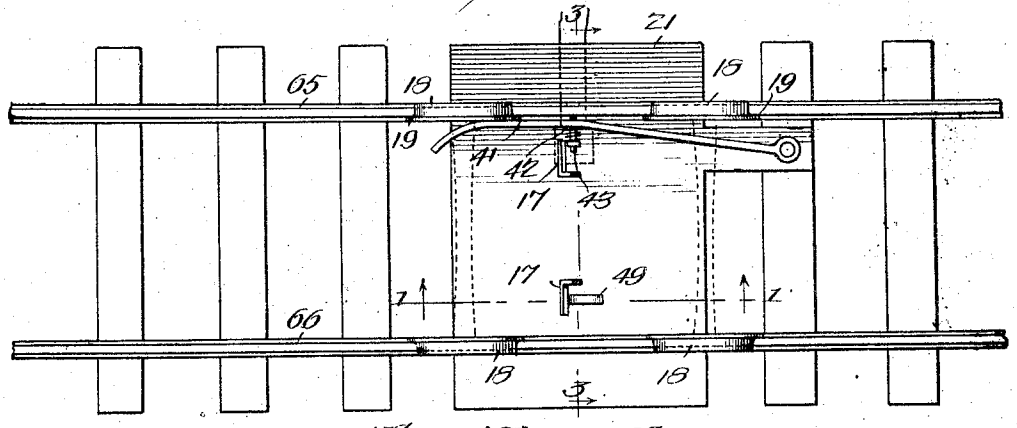
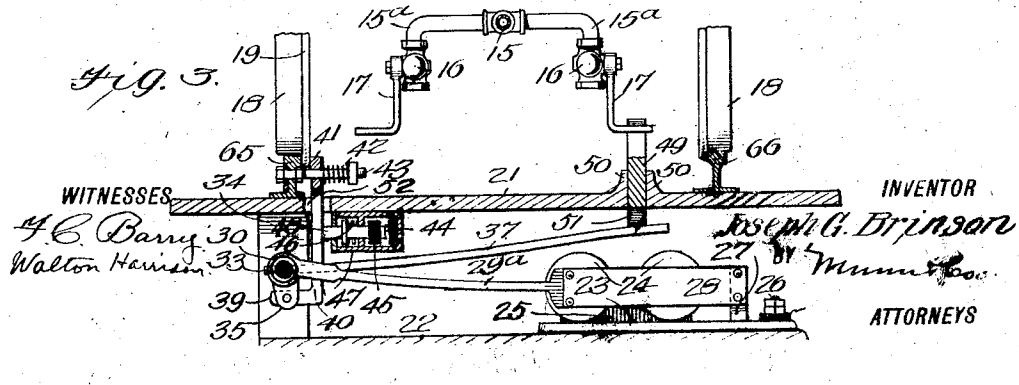


Fig. 3.



WITNESSES

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4 SHEETS—SHEET 2

Fig. 4.

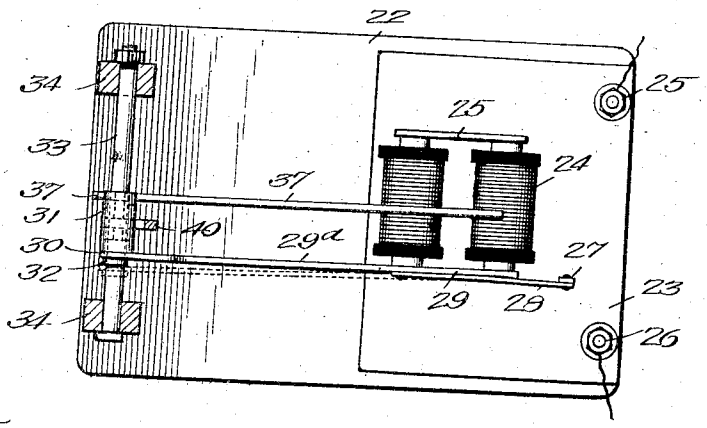


Fig. 5.

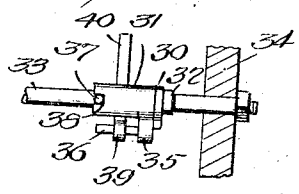


Fig. 6.

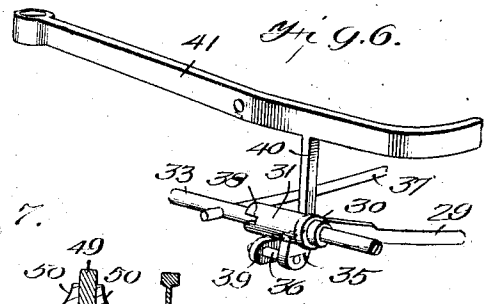
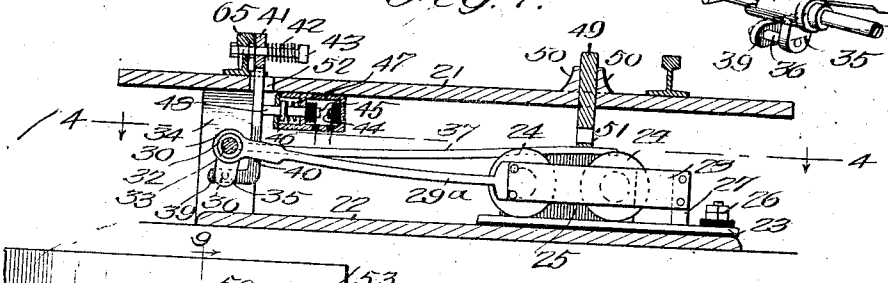


Fig. 7.



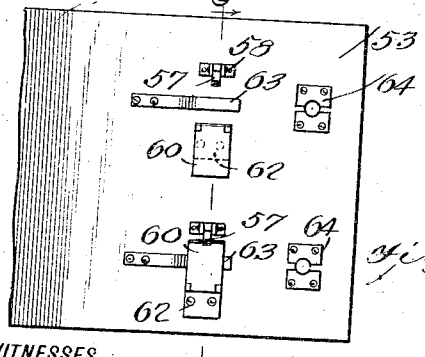
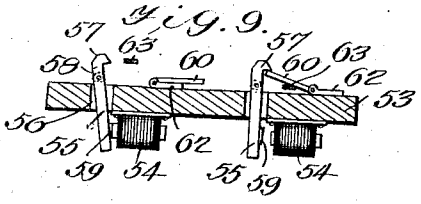


Fig. 8.

Fig. 9.



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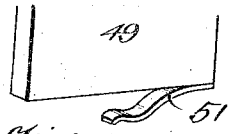


Fig. 10.

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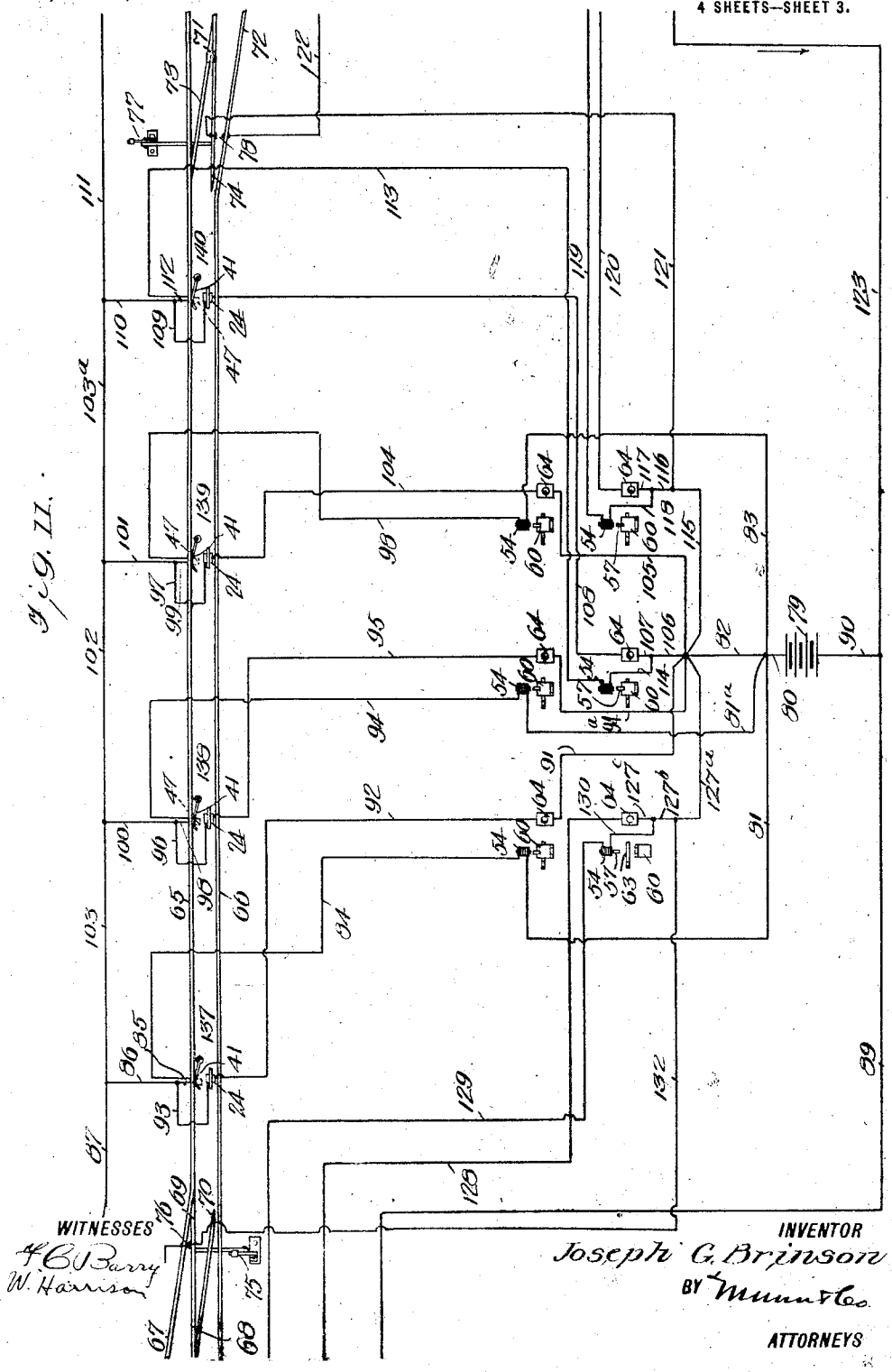
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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

Fig. 12.

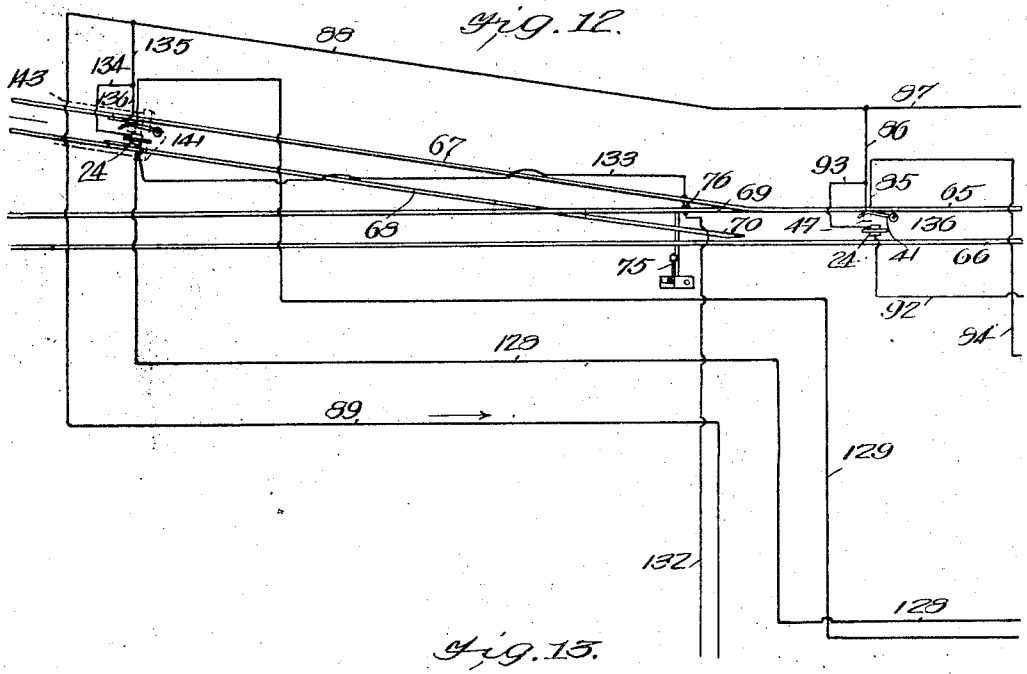
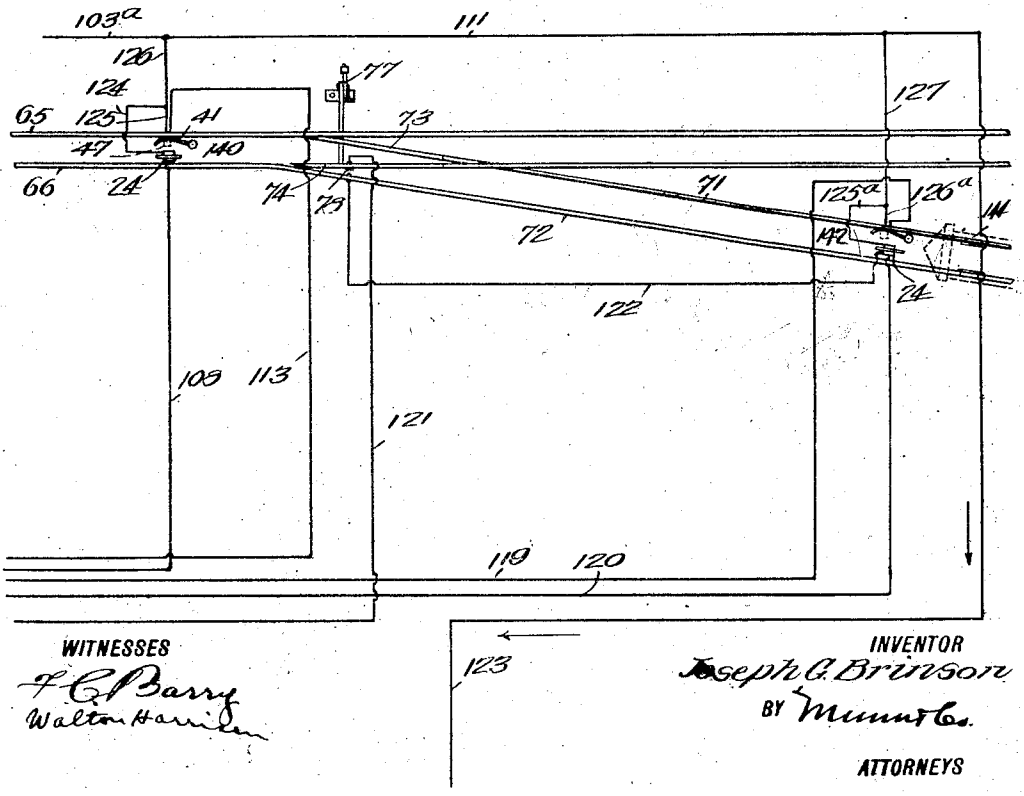


Fig. 15.



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UNITED STATES PATENT OFFICE.

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TRAIN-STOP.

1,152,283. Specification of Letters Patent. Patented Aug. 31, 1915.

Application filed July 14, 1913. Serial No. 779,069.

To all whom it may concern:

Be it known that I, JOSEPH G. BRINSON, a citizen of the United States, and a resident of Idaho Fal's, in the county of Bonneville and State of Idaho, have invented a new and useful Improvement in Train-Stops, of which the following is a specification.

My invention relates to train stops—that is to mechanism used for automatically stopping a train when the latter would otherwise be exposed to danger.

More particularly stated, my invention relates to train stops of the kind operated by electricity and controllable automatically by a predetermined condition of one or more electric circuits.

My invention further relates to the construction employed at intervals along the main track, or along a siding and controllable by the condition of one or more electric circuits for operating a track obstacle so as to throw the same into suitable position to actuate the portions of the stop mechanism carried by the train.

My invention further relates to various improvements in train stopping mechanisms and parts accessory thereto for the purpose of improving the general efficiency thereof.

Reference is made to the accompanying drawings forming a part of this specification, and in which like letters indicate like parts.

Figure 1 is a side view partly in elevation and partly in section showing the track obstacle mechanism located along the track, for purposes of actuating the train stopping device carried by the train. Fig. 2 is a view partly in plan and partly in horizontal section of the track obstacle mechanism. Fig. 3 is a vertical cross section on the line 3—3 of Fig. 1, looking in the direction of the arrow. Fig. 4 is a section on the line 4—4 of Fig. 7 looking in the direction of the arrow, and showing certain portions of the track obstacle mechanism. Fig. 5 is a detail showing the clutch device of the track obstacle mechanism. Fig. 6 is a detail showing in perspective the clutch device and the movable track tongue for actuating the same. Fig. 7 is a vertical cross section through the track obstacle mechanism and a portion of the railway track above the same. Fig. 8 is a detail showing a part of the switch-board employed at a station for controlling my system. Fig. 9 is a section on the line 9—9 of Fig. 8, looking in the direction of the arrows. Fig. 10 is a detail showing in perspective the bottom of the track detent or plate forming part of the track obstacle mechanism. Fig. 11 is a diagrammatic view of a portion of the wiring and track mechanism associated therewith. Fig. 12 is a diagram showing fragmentarily the wiring and track mechanism associated with the left of Fig. 11, and, Fig. 13 is a diagram showing the track and wiring associated with the right of Fig. 11.

A locomotive is shown at 14 and is provided with a train pipe 15, the latter forming a part of an air brake system for stopping the train, or at least the locomotive, shown, whenever the train pipe is vented. The train pipe 15 is provided with two branches 15^a (see Fig. 3) and each of these branches carries an air valve 16 controllable by a trip arm 17, so that when either of these arms is tripped, as hereinafter described, the adjacent valve 16 is actuated, the train pipe vented, and the air brakes thus applied. If desired, mechanism for the purpose of shutting off steam may also be operated by the venting of the train pipe. Such mechanism being old and well known and forming no part of my invention, I do not deem it necessary to describe it.

The locomotive 14 is provided with wheels 18 having flanges 19, these parts being of the usual or any desired construction. A casing 20, which contains the track obstacle mechanism and is therefore designated as a track obstacle casing, may be made of any suitable material, and is preferably located under ground or at least under the track. It is provided with a cover 21 which may, if desired, be removable at the will of the operator in order to permit accessibility to the casing. Located within the bottom of the casing is a board 22, and mounted upon this board is a plate 23. Mounted over the plate 23 is an electro-magnet 24, a portion 25 of the plate (see Fig. 7) being upturned in order to support the magnet, this portion forming virtually the back bar of the mag-

net. Two binding posts 26, carried by the plate 23 and insulated therefrom, are connected with the magnet 24. A standard 27 carried by the plate 23 and extending upwardly from the same, supports a leaf spring 28, the latter carrying an armature 29. This armature is provided with a tongue 29ª extending from one end of it and carrying an annular bearing 30, as will be understood from Figs. 3 and 7. The annular bearing 30 engages a clutch sleeve 31 having a general cylindrical form and provided with a neck 32, this neck being encircled by the annular bearing 30. A rocking shaft 33 is supported by two standards 34, the latter being fixed within the casing. The clutch sleeve 31 is provided with a crank 35 which carries a crank pin 36, the latter extending substantially parallel with the axis of the clutch sleeve 31. The rocking shaft 33 is provided with an arm 37 extending diametrically through and some distance from it to the right, according to Fig. 7. The clutch sleeve 31 is provided with notches 38 which are adapted to fit around the arm 37 when the clutch sleeve 31 is moved in the general direction of its axis for this purpose, as may be understood from Figs. 5 and 6.

The crank pin 36 carried by the crank 35 extends loosely through an eye 39, this eye being carried by and forming a part of an arm 40. This arm is supported upon the under side of a switch arm 41 and is rigid relatively to the same. The switch arm however is movable and is of the form shown more particularly in Figs. 2 and 6. A spring 42 engages the switch arm 41 and presses upon it so as to retain it normally in predetermined position. The spring 42 is supported upon a bolt 43 which is adjustable for the purpose of controlling the tension of the spring. Located within the casing 20 is an electric switch 47. This switch comprises a stationary contact member 44, a movable contact member 45, and a spring 46. The movable contact member is provided with a protruding portion 48 which extends against the track tongue 41. The parts are so arranged that when this track tongue is moved to the right, according to Fig. 7, the arm 40 by pressing against the portion 48 of the movable contact member 45 causes this contact member to move into engagement with the stationary contact member 44. A track detent or plate 49 extends vertically through a slot in the cover 21 and is rounded upon its upper edge, as may be understood from Fig. 1. The cover 21 is thickened slightly at 50 so as to strengthen it where it is mutilated by the detent 49. The trip plate 49 carries a leaf spring 51 secured upon its bottom edge, this leaf spring engaging the arm 37 so that the weight of the trip plate 49 rests directly upon this arm. The cover 21 is provided with a slot 52 through which the arm 41 extends, the slot in question being large enough to allow the arm 41 to have some play.

When the magnet 24 is energized it attracts the armature 29, causing the same to swing horizontally, and when this occurs the annular bearing 30 causes the cylindrical sleeve 31 to move in the general direction of its axis along the rocking shaft 33 so that the notches 38 fit upon the arm 37. The parts thus remain so long as the magnet 24 continues energized. If during this time it happens that the switch 41 is shifted to the right, according to Fig. 7, which occurs when the switch 41 is engaged by the flange 19 of the car wheel 18 so that the switch arm 40 is shifted to the right, according to Fig. 7, the rocking shaft 33 is rocked slightly in a contra-clockwise direction according to this figure, and the arm 37 thus pushes the detent 49 directly upward. The magnet 24 however may be energized for any length of time, and the detent 49 may still remain in its normal position, as shown in Fig. 7, provided the switch arm 41 is not moved—or in other words, provided no train comes along. The track obstacle mechanism may be thus set, by energizing the magnet 24, and yet the detent 49, remaining in its lowermost position until the arrival of a train, is thoroughly protected from injury and is also prevented from injuring any moving object above the track obstacle mechanism.

A switchboard 53 is located at any convenient point, preferably at a station. Mounted upon this switchboard are a number of drop magnets 54, and adjacent to each drop magnet is a drop lever 55 which extends through a hole 56 in the switchboard. Each drop lever is provided at one of its ends with a hook 57, and is pivotally mounted upon a pin 58. Each drop lever 55 carries an armature 59 associated with one of the magnets 54, as may be understood from Fig. 9. A drop shutter 60 associated with each magnet 54 is journaled upon a plate 62 and adapted to be brought into either of two positions, as indicated in Fig. 9. A leaf spring 63 mounted upon the switchboard 54 is located adjacent to each drop lever 55 and shutter 60 in such manner that the shutter 60 may be swung over into engagement with the leaf spring, and caught or secured to the adjacent hook 57. The shutters 60 are thrown over to the left, according to Fig. 9, and secured by the hooks 57 to the respective drop levers 55, as shown at the right of Fig. 9. Then when any magnet 54 is energized it pulls its armature 59 so as to shift the position of the drop lever 55. This liberates the drop shutter 60, and the latter under impulse of its spring 63 is thrown over to the right, according to Fig. 9. The switchboard 53 is further provided with a

number of plug contacts 64—that is contacts which are adapted to be closed by the insertion of a metallic plug, in a manner well known in this art. The purpose of the plug contacts 64 is to enable the operator to energize the magnets 24 as hereinafter described. The various drop magnets 54, drop levers 55, drop shutters 60 and leaf springs 63 constitute effective drop mechanisms controllable independently from a distance, as hereinafter described.

The main track rails are shown at 65 and 66, and at 67, 68 are siding rails which are stationary. At 69, 70, are movable track tongues for mechanically controlling the entrance to the siding. At 71, 72, are tracks of another siding, and at 73, 74, are movable track tongues for mechanically controlling the relations of this siding and the main track. A hand operated switch mechanism 75 controls the switch tongues 69, 70, and is provided with an electric contact 76 which is opened or closed as the mechanism 75 is actuated. At 77 is another hand operated switch mechanism which is connected with the movable tongue 73, 74, and is provided with a contact 78 which is opened and closed by movements of the mechanism 77.

A battery is shown at 79 and is conveniently located at a station. Connected with this battery is a wire 80 and connected with this wire are other wires 81, 81ª, 82, 83. The wires 81, 81ª, 83 lead to magnets 54 carried by the switchboard 53. From the magnet 54 connected with the wire 81, a wire 84 leads to one of the switches 47 located along the main track, and above described. Connected with this switch is a wire 85 and connected with this wire is a wire 86. The wire 86 is connected with a wire 87. A wire 88 is connected with the latter and with a wire 89. A wire 90 connects the battery 79 with the wire 89. Connected with the wire 82 is a wire 91 which leads to one of the plug contacts 64. A wire 92 is connected with this contact and with one of the magnets 24 above described, and located adjacent the track. This magnet is connected with a wire 93, the latter being connected with the wires 85 and 86. A magnet 54, connected with the wire 81ª, is also connected with a wire 94 which leads to one of the electric switches 47.

Wires 95 and 96 are connected with one of the magnets 24, the wire 95 being also connected with one of the plug contacts 64. A wire 94ª is connected with this plug contact and with the wire 82. A wire 97 is connected with one of the magnets 24, and also with a wire 99 which leads to one of the switches 47. A wire 98 is connected with this switch 47 and with one of the magnets 54. A wire 101 is connected with the two wires 97 and 99, and is also connected with two wires 102, 103ª. A wire 100 is connected with the wires 102, 103 and also with the wires 96 and 98. A wire 104 leads from the magnet 24, to which the wire 97 is connected, to one of the plug contacts 64, and from the latter leads a wire 105 which is connected with the wire 82. A wire 106 is connected with the wire 82 and with a wire 107, the latter being connected with one of the plug contacts 64. A wire 108 leads from this plug contact to one of the magnets 24. Leading from the latter is a wire 109 which is connected with two wires 110, 112. A wire 111 is connected with wires 103ª and 110. A wire 113 leads from one of the electric switches 47 to one of the magnets 54. A wire 114 is connected with the wires 106, 107 and with the last mentioned magnet 54. A wire 115 is connected with the wire 82 and with two wires 116, 121. Connected with the wire 116 is a wire 117 which leads to one of the plug contacts 64. A wire 118 is connected with the two wires 116 and 117, and leads to one of the magnets 54. From the latter a wire 119 leads to one of the switches 47, the latter being associated with the siding shown in Fig. 13, and located at the right of Fig. 11. A wire 120 leads from one of the plug contacts 64 to a magnet 54 associated with the siding just mentioned. A wire 121 is connected with the wires 115 and 116 and leads therefrom to the contact 78. From this contact a wire 122 leads to the same magnet 54 to which the wire 120 is connected. A wire 123 leads from the wire 90 to the wire 111 with which it is connected. A wire 124 is connected with the magnet 54 to which the wire 108 is connected. The wire 124 is also connected with two wires 125, 126, the wire 125 leading to one of the switches 47, and the wire 126 being connected to the two wires 103ª and 111. Connected with the wires 111, 123 is a wire 127, which is also connected with two wires 126ª and 125ª. The wire 126ª leads to one of the electric switches 47. The wire 125ª is connected with the magnet 54 to which the wires 120, 122 are connected. A wire 127ª is connected with the wire 82 and also with a wire 127ᵇ. Connected with this wire is a wire 127ᶜ which leads to one of the plug contacts 64. From this plug contact a wire 129 leads to one of the switches 47, the latter being associated with the siding shown at the left of Fig. 11, and appearing also in Fig. 12. From the magnet 54, to which the wire 129 is connected, a wire 130 leads to the two wires 127ᵇ, 127ᶜ. A wire 132 is connected to the two wires 127ª, 127ᵇ and leads therefrom to the contact 76 which is controlled by the track switch 75. From the contact 76 a wire 133 leads to the left, according to Fig. 12, to a magnet 54. From the latter a wire 134 leads to two wires 135, 136. The wire 135 is connected to two wires 88, 89 and the wire 136 leads to one of the

electric switches 47, this being the switch to which the wire 129 is connected.

The various track obstacle mechanisms distributed along the main track, and each considered as a unit, are shown at 137, 138, 139, 140. Similarly the track obstacle mechanism upon the siding are designated respectively as 141, 142. A locomotive 143 is shown as occupying the siding in Fig. 12 and another locomotive 144 is disclosed as occupying the siding in Fig. 13.

While the several magnets 54, the drops respectively associated therewith, and the plug contacts 64 are shown diagrammatically in Fig. 11, it will be understood that these various mechanical parts are conveniently assembled upon the single switchboard 53, as shown in Figs. 8 and 9 which may be located at a station anywhere near the battery 79.

The operation of my device is as follows: I will suppose that at first no trains are present, and as a consequence the main track (see middle of Fig. 11) is clear. All circuits are now open and the battery 79 is idle. A train now comes along, traveling, I will say, to the right according to Fig. 11. As this train successively passes the several track obstacles 137, 138, 139, 140, the various drop shutters 60 connected with and corresponding to the obstacles in question are actuated in succession. The travel of the train, therefore, is automatically registered at the station, the drops after being thrown remaining in their respective abnormal position until restored to normal position by the operator. As the electric action is the same for all of the track obstacles, I will simply describe it with reference to the obstacle 137. When the train arrives at this obstacle, one of the car wheels engages the switch arm 41 and forces it inwardly away from the adjacent rail 65, as will be understood from Fig. 2. The movement of the switch arm 41 causes the arm 40 to move slightly to the right, according to Fig. 7. As the arm 40 is rigid relatively to the switch arm 41, the crank 35 is rocked slightly in a contra-clockwise direction, according to Fig. 7. Since, however, the clutch sleeve 31 occupies its normal position so that the notches 38 are free of the arm 37, the rocking of the clutch sleeve 31 does not move the shaft 33 or the arm 37. The movement of the arm 40, however, actuates the clutch 47 in that it presses the portion 48 of the movable contact member 45 and brings this contact member into engagement with the stationary contact member 49. The following circuit is thus completed: battery 79, wires 80, 81, drop magnet 54, wire 84, electric switch 47, wires 85, 86, 87, 88, 89, 90 back to battery 79. This energizes the magnet 54 just mentioned, and causes the drop shutter 60, associated with this magnet, to be actuated. As the train passes the various track obstacles 138, 139, 140, other shutters 60 corresponding to these track obstacles are actuated in succession. The operator thereupon after noting the progress and position of the train restores the drop shutters to their respective normal positions.

I will next suppose that the operator wishes to stop a train, say at any predetermined one of the obstacles 137, 138, 139, 140. The action being essentially the same for stopping the train at any one of these obstacles, I will assume that the train is to be stopped at the track obstacle 139. For this purpose, the operator places a plug in the plug contact 64 connected and associated with the obstacle 139. In doing this the following circuit is completed: battery 79, wires 80, 82, 105, plug contact 64, wire 104, magnet 24, wires 97, 101, 102, 103, 87, 88, 89, 90, back to battery 79. This energizes the magnet 24 of the obstacle 139. The magnet 24 being thus energized (see Figs. 3 to 7 inclusive) the armature 29 is attracted, and the clutch sleeve 31 is moved axially along the shaft 33 so as to engage the arm 37 (see Figs. 4 and 5) the arm 37 being thus connected in operative relation, for the time being, to the arm 40. So long now as the magnet 24 remains thus energized, and the arm 40 is not moved by the passage of a train, the detent plate 49 is not disturbed. When, however, a train comes along and reaches the track obstacle 139 so that the wheels of this train engage the switch arm 41, and press the same away from the rail 65, as above described, this movement of the switch arm 41 causes the vertical arm 40 to move to the right, according to Fig. 7, and to rock the crank 35 slightly in a contra-clockwise direction, according to said figure. In doing this the clutch sleeve 31 is rocked in the direction just indicated and the arm 37 at its free end—that is the end to the right according to Fig. 7—is raised thus lifting the detent 49 directly upward. This detent 49 being thus raised is struck by one of the arms 17 carried by the locomotive 14, the result being that the train pipe 15 is vented, and the brakes applied automatically, the train being thus brought to a stop. The arrival of the train at the track obstacle 139 is registered the same as the arrival of the train at any other track obstacle, as above described.

I will next suppose that a train 143 is in the siding shown in Fig. 12, and partially shown at the left of Fig. 11. When this train passes the track obstacle 141, it registers its indication substantially as above described with reference to other track obstacles and other trains. The operator at the station is thus apprised of the presence of the train 143 in the siding in question. The operator can stop the train in the siding in

like manner that he could stop a train upon the main track. Suppose now that the hand operated track switch 75 is actuated so as to close the contact 76 which is normally open. This is done for instance to guard against the possibility of the train 143 passing the track obstacle 141 and thus entering upon the main track at an inopportune time. The hand switch 75 being actuated and the contact 76 being thus closed, a circuit is completed as follows: battery 79, wires 80, 82, 127a, 132, contact 76, wire 133, magnet 54, wires 134, 135, 89, 90, back to battery 79. This energizes the magnet 54 associated with the track obstacle 141 and sets the electric switch 47 of this track obstacle. When, therefore, the train moving on the siding in question undertakes to pass the track obstacle 141, the train is stopped in the manner above described. A similar action takes place if the train 144, shown at the right of Fig. 13, under similar circumstances undertakes to pass to the left into the main track.

As an independent proposition, the operator can stop the train in a siding by use of the plug contact 64 as above described. If the hand operated switch mechanism 77 be so actuated as to close the contact 78, this has an effect quite analogous to that of inserting a plug in the plug contact 64 corresponding to the track obstacle 142, and the train 144 is thus effectively stopped.

I do not limit myself to the precise arrangement shown as variations may be made therein without departing from the spirit of my invention.

I claim:

1. A track obstacle mechanism including an electro-magnet, means for energizing the same from a distance at will, a movable track detent, a rock shaft adapted to be arranged longitudinally of a track and being provided with an arm adapted upon movement of the rock shaft to actuate the detent, a clutch sleeve loosely mounted on the rock shaft and operably connected with the electro-magnet and adapted to be shifted longitudinally of the rock shaft into engagement with the arm and when so shifted to be rocked with respect to rotary movement relatively to the rock shaft, a switch arm adapted to be arranged adjacent the track and adapted to be actuated upon every passage of rolling stock, an arm fixedly connected with the switch arm and having a sliding connection with the clutch sleeve and adapted to rock the latter upon actuation of the switch arm, and an indicating mechanism operably connected with the switch arm and adapted to be actuated thereby for disclosing to an operator the passage of a train.

2. In a track obstacle mechanism the combination of a casing provided with a slot, a detent extending loosely through said slot, and provided with a spring, an arm engaging said spring and supporting the weight of said detent, a rocking shaft carrying said arm and adapted to be rocked in order to lift said drop member, a clutch member encircling said shaft and normally loose relatively thereto, and electrically operated mechanism controllable from a distance for securing said clutch member and said rocking shaft rigidly together.

3. A device of the character described, comprising a rock shaft arranged longitudinally with respect to a track, a track detent disposed in spaced relation to the rock shaft and operable by movements of the rock shaft, a clutch member disposed upon the rock shaft and movable longitudinally thereof, an electro-magnet controllable from a distance, mechanism operable by the electro-magnet for shifting said clutch member longitudinally of the rock shaft, means adapted to be engaged by the clutch when moved into one position for locking the clutch relatively to the rock shaft, and an element movable laterally with respect to the track and controllable by the passage of a piece of rolling stock for rocking the clutch member.

4. A device of the class described, comprising a rock shaft arranged longitudinally with respect to a track, a track detent operably connected therewith, a clutch member movable longitudinally and rotatably upon the rock shaft, electrically controlled mechanism for shifting the clutch member longitudinally of the rock shaft in one direction or another, means engageable by the clutch member for locking the same to the rock shaft when moved into one position, and an element movable laterally with respect to the track and movable by rolling stock and adapted to rock the clutch member upon every passage of rolling stock.

5. A device of the class described comprising a rock shaft, a track detent operably connected therewith, a clutch loosely mounted on the rock shaft and movable longitudinally thereof into locking position therewith, a switch arm movable transversely of the rock shaft by action of rolling stock, a loose connection between the switch arm and clutch whereby to rock the clutch upon movement of the arm, and whereby to allow longitudinal movement of the clutch relatively to the arm, and electrically controlled means for interlocking the clutch and the rock shaft.

6. A device of the class described comprising a rock shaft, a clutch movable rotatably and longitudinally with relation to the shaft, a rolling stock operable switch arm, connecting means between the switch arm and clutch whereby to rock the latter upon movement of the arm and to allow

longitudinal movement of the clutch relatively to the rock shaft, means controllable at a distance for moving said clutch longitudinally of the rock shaft at will, a track detent, and connecting means between the track detent and rock shaft for operating the former upon movement of the latter, said clutch adapted to interlock with said connecting means upon longitudinal movement of the clutch.

JOSEPH G. BRINSON.

Witnesses:

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MYRTLE HEATH.