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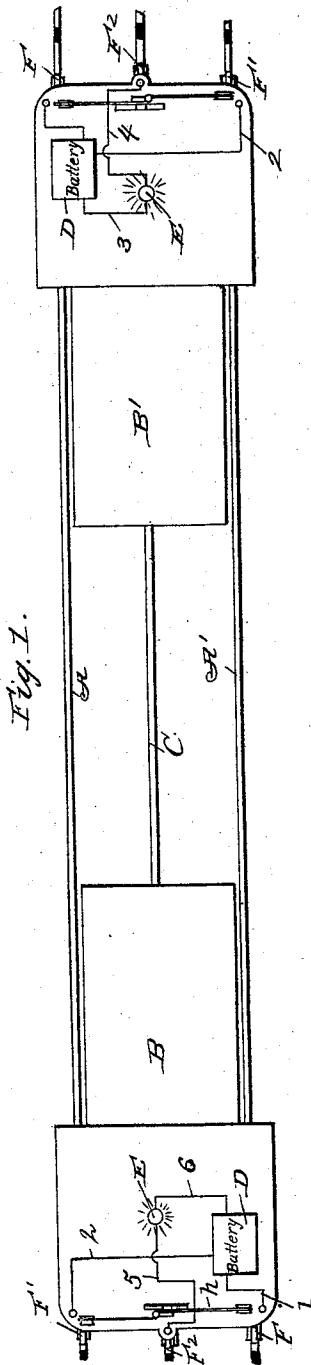
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J. DUTREY.

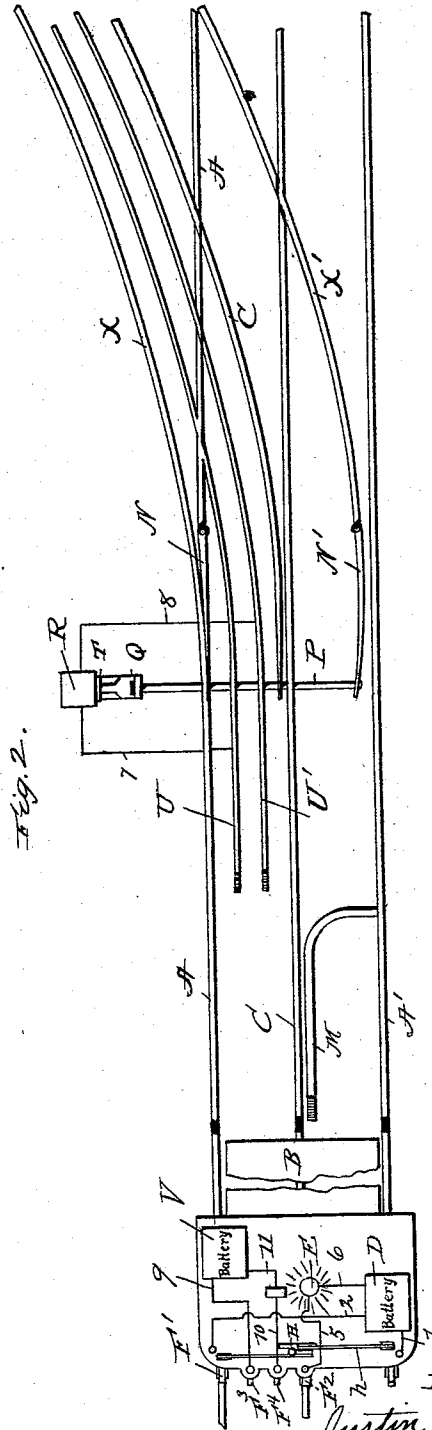
ELECTRICAL SIGNAL AND SWITCH OPERATING APPARATUS.

No. 536,271.

Patented Mar. 26, 1895.



Witnesses:
A. Paeder
N. C. Matthews.



Inventor
Justin Dutrey
By *James J. Sheehy*
Attorney

(No Model.)

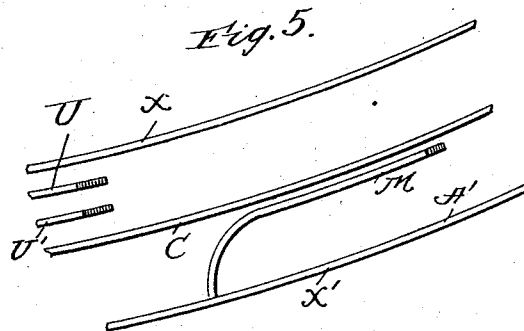
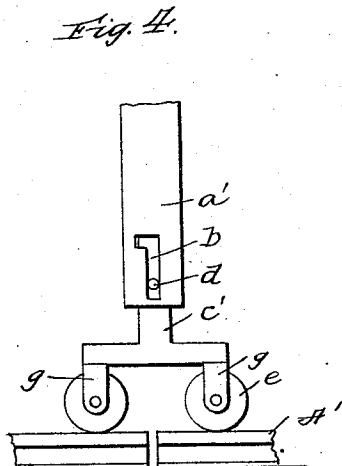
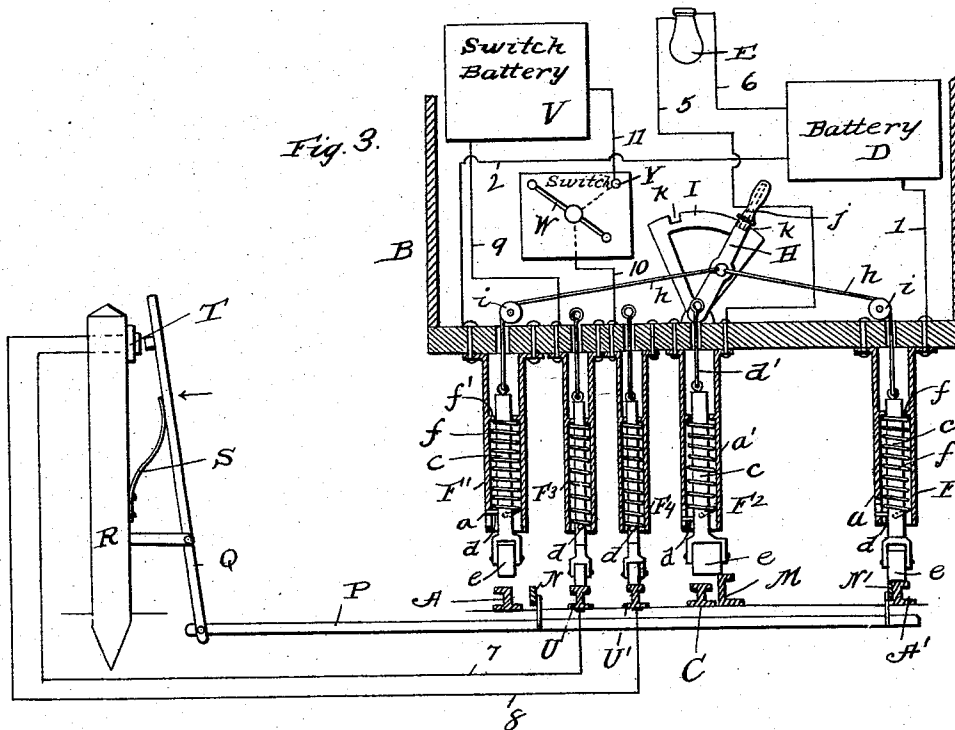
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Witnesses:

W. F. Matthews

Inverton
 Justin Dutrey
 By James J. Sheehy
 Attorney

UNITED STATES PATENT OFFICE.

JUSTIN DUTREY, OF NEW ORLEANS, LOUISIANA.

ELECTRICAL SIGNAL AND SWITCH-OPERATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 536,271, dated March 26, 1895.

Application filed July 19, 1894. Serial No. 518,004. (No model.)

To all whom it may concern:

Be it known that I, JUSTIN DUTREY, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Electrical Signal and Switch-Operating Apparatus; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it apper-

My invention relates to improvements in electrical signal and switch operating apparatus; and it has for one of its objects to provide an electrical signal apparatus adapted to effect communication between two or more locomotives traveling upon the same track and apprise the engineer on each, of the presence of the other so as to enable them to avoid a collision.

Another object of the invention is to provide an electrical signal apparatus adapted to apprise an engineer on a moving train when he is approaching a switch, and still another object is to provide an electrical apparatus through the medium of which the engineer, may without slackening the speed of his train, open the switch so as to go upon the siding or turnout, if he so desires.

With the foregoing ends in view the invention will be fully understood from the following description and claims when taken in connection with the annexed drawings, in which—

Figure 1, is a diagrammatic plan view of a railway track and two locomotives equipped simply with that portion of my improved signal apparatus which is adapted to apprise the engineer of each train of the presence of the other. Fig. 2, is a diagrammatic plan view of a portion of a railway track and turnout together with a locomotive equipped with my improved electrical signal and switch operating apparatus. Fig. 3, is a transverse section of the track taken in the plane indicated by the line x, x , of Fig. 2; the same being shown in conjunction with a portion of a locomotive equipped with my improvements. Fig. 4, is a detail elevation of one of the depending trolleys of the locomotive, and Fig. 5, is a detail view of a portion of the track adjacent to the switch.

Referring by letters and figures to said drawings:—A, A', indicate the rails of a railway track, and B, B', indicate two locomotives which are shown in Fig. 1, upon a single track.

In carrying out the first part of my invention I arrange an auxiliary rail or electric conductor C, midway between the rails A, A', and equip each locomotive with a battery or other electric generator D, and with an incandescent electric light or other visible or audible signal E. The generator D, of each locomotive is electrically connected with trolleys, shoes, brushes, or other devices F, F', (presently described) which are carried by the locomotives and are designed to bear and travel upon the rails A, A', and the light E, of each locomotive is likewise connected with a trolley, brush, or other devices F², which bear and travel upon the intermediate rail or conductor C, as shown. The said rails A, A', C, are divided into insulated blocks or sections (the insulations not being illustrated) so that the engineer of one train will only be apprised of the presence of the other when the two are upon the same block or section.

The trolley or brush F², of each locomotive should always be in contact with the rail C, when the engineer desires to ascertain if the track is clear, but with the locomotives in the position shown in Fig. 1, only the trolley or brush F, of the locomotive B, and the trolley or brush F', of the locomotive B', should be allowed to contact with the rail A', adjacent thereto; the other trolleys or brushes F², and F, of the locomotives B, B', respectively being held out of contact with the adjacent rail A. The trolleys or brushes F', and F, of the locomotives B, B', respectively, are however employed when the locomotives have been turned around and the said trolleys F', and F, rest over the rail A', it being understood that only one of the track rails, in the present case the rail A', is to be employed as a conductor, in order that the engineers of the locomotives will know which rail to use in order to ascertain if the track is clear.

From the foregoing it will be seen that when two locomotives, such as B, B', are traveling upon the same track and the engineer of the locomotive B, has lowered the trolleys, brushes, or the like F, F², to contact with the rails A', and C, respectively, and the engineer of the

locomotive B', has lowered the trolleys or brushes F', F², to contact with said rails A', C, a complete electric circuit will be formed and the current, with the arrangement of wires better shown in Figs. 1, and 3, will flow from the battery D, of the locomotive B, through the wire or other electric connection I, the trolley F, the rail A', the trolley F', of the other locomotive, the wire 2, the battery D, the wire 3, the lamp or other signal E, the wire 4, the trolley F², the rail C, the trolley F², of the first named locomotive and by the wire 5, lamp E, and wire 6, of said locomotive back to the battery thereof. When the circuit is thus completed, the lamps E, in the cabs of both locomotives will be lighted so as to apprise the engineer of each locomotive of the presence of the other and enable him to take the proper precautions to avoid a collision.

I prefer in practice to employ the arrangement of wires or electrical connections better shown in Figs. 1, and 3, but I do not desire to be understood as confining myself to such arrangement as the connections between the several trolleys or other contact devices and the lamps or other signals and the generators D, may be effected in any approved manner.

Of the several devices that may be employed to contact and make electrical connection with the rails A', C, I prefer to employ the depending trolleys or contact devices F, F', F², illustrated in Figs. 3, and 4; the trolley F', which is shown in Fig. 3, as resting above the rail A, being designed to contact with the rail A', when the locomotive has been turned around as before described. The trolleys or contact devices F, F', are of a common construction and they respectively comprise a sleeve a, which is connected to and depends from the cab floor or other suitable part of a locomotive, a vertically movable plunger c, arranged in the sleeve a, and having a projection as d, and also having one or more wheels e, at its lower end, and a coiled spring f, surrounding the plunger and bearing at one end against a projection f', of the sleeve and at its opposite end against the projection d, of the plunger and tending to force said plunger downwardly so as to carry the wheels e, thereof into engagement with the rails. The plunger C, of each contact device is bifurcated or provided with two branches g, arranged one in front of the other as shown in Fig. 4, and in these branches g, are arranged the wheels e, said wheels being so arranged in order that one may rest on one rail and the other on another rail at the joint of said rails and prevent any interruption of the current in case the contiguous ends of the rails are not together.

In order to raise the plunger c, of the contact device F', and at the same time permit the plunger c, of the contact device F, to be pushed downwardly by its spring, or vice versa, I provide the lever H, which is pivotally mounted or fulcrumed in suitable bear-

ings in the locomotive and is connected with the plungers of the two devices F, F', by cords or chains h, which take over sheaves i, as illustrated. The lever H, is provided with a suitable detent j, and a fixed segment I, having two notches k, for the engagement of the detent j, is provided adjacent to the lever H, whereby it will be seen that the lever and the plungers of the trolleys or contact devices may be conveniently secured in their adjusted positions by the engineer.

The contact device F², better illustrated in Fig. 4, differs from the devices F, F', in that its sleeve a', is provided with a bayonet slot b, for the engagement of the projection d, of its plunger c', and the said plunger is provided with a handle as d', whereby it will be seen that it may be raised by the engineer and turned when desired, so as to cause the projection d, to engage the horizontal portion of the slot b, and secure it in its raised position.

In order to enable an engineer on a moving train to ascertain when he is approaching an open switch, I provide the rail M, which is connected at one end to the rail A', and lies alongside of and close to but insulated from the rail C, and which is of a slightly greater height than said rail C, and preferably has its ends beveled as shown in Fig. 3. This rail M, may be of any suitable length and may be arranged at any suitable distance in advance of a switch; and when it is employed the wheel or wheels e, of the contact device F², of the locomotive are preferably made broad as shown in Fig. 3, so as to enable them to engage both the rail C, and the rail M.

When the device F², on the locomotive B, for instance engages the rail M, as the locomotive passes over the same the circuit will be completed and the current will flow from the battery D, (see Fig. 3,) through the wire 1, the contact device F, the rail A', the rail M, the contact device F², the wire 5, the lamp E, and the wire 6, back to the battery and lighting the lamp will notify the engineer to exercise precaution and will also notify him that it is time to open the switch, if he desires to go upon the same.

In order to enable an engineer on a moving train to open a closed switch as he approaches the same, I provide in conjunction with the main track rails A' A, the turnout rails X, X', and the pivoted switch points N, N', which are connected to the rails A, and X', respectively, a pitman P, which is connected to the points N, N', as better shown in Fig. 3. This pitman P, is connected at one end to the lower end of an armature lever Q, which is fulcrumed at an intermediate point of its length and is normally pressed away from the post R, by a spring S, attached thereto, whereby it will be seen that the switch will be normally closed to a train traveling upon the main track. The post R, is provided with one or more electric magnets T, designed to attract the armature lever Q, and open the

switch; and in order that these electro-magnets T, may be energized by an engineer on a moving train, I provide the parallel curved tracks U, U', which are preferably beveled at their ends and are connected by the wires 7, 8, with the electro-magnet T, and are designed to be engaged by the contact devices F³, F⁴, of the locomotive. These contact devices F³, F⁴, are constructed in a manner similar to the contact device F², before described; and the contact device F³, is electrically connected by a wire as 9, with a battery or other generator V, on the locomotive, while the contact device F⁴ is electrically connected by a wire as 10, with a switch lever W. The battery or generator V, is also connected by a wire as 11, with a contact plate Y, on the switch, whereby it will be seen that when the contact devices F³, F⁴, are in engagement with the tracks U, U', and the switch lever is turned to engage the contact plate Y, the current will flow from one pole of the battery or other generator V, through the wire 9, contact device F³, track U, wire 7, electro-magnets T, wire 8, track U', contact device F⁴, wire 10, switch lever W, contact plate Y, and wire 11, to the other pole of the battery or generator V, and energizing the magnets T, will enable them to draw the armature lever Q, in the direction of the arrow (see Fig. 3,) so as to close the switch and permit the train to go upon the siding or turnout rails.

It is only necessary for the engineer, in order to go upon the siding, to lower the devices F³, F⁴, and move the switch lever W, to the contact plate Y, as soon as he receives the signal that he is approaching the switch, when the devices described will open the switch and hold it open until the train has passed on the siding; the rails U, U', being preferably made twice as long as the ordinary train.

It will be seen from the foregoing that I have provided a very simple and cheap apparatus whereby the engineers of two locomotives traveling on the same track will be apprised of the presence of each other, and whereby an engineer will be notified when he is approaching a switch. It will also be seen that I have provided a very simple and practical apparatus whereby an engineer on a moving train may open a switch and go upon a siding without stopping or reducing the speed of his train.

I have in some respects specifically described the construction and relative arrangement of the several elements of my improved apparatus in order to impart a full and clear understanding of the same, but I do not desire to be understood as confining myself to such construction and arrangement as such changes or modifications may be made in practice as fairly fall within the scope of the invention.

It will be obvious from the foregoing that when my improved switch operating apparatus is employed upon electric railways, the battery V, might be dispensed with and the

storage battery of the cars (if storage battery cars are employed) might be arranged in circuit with the switch operating devices, or if the railway is a trolley road, the switch operating devices might be arranged in circuit with the trolley wire.

Having described my invention, what I claim is—

1. An electrical signal apparatus, comprising a railway track, a rail or conductor C, a rail or conductor M, electrically connected with one of the track rails and arranged adjacent to and in a plane slightly above the rail C, a locomotive or car provided with a contact device adapted to engage the track rail with which the rail M, is connected and a vertically adjustable contact device adapted to engage the rail C, and the rail M, and a battery or other generator and an electric signal carried by the locomotive and electrically connected with each other and with the contact devices, substantially as and for the purpose set forth.

2. In an electric apparatus, the combination with a locomotive or car, and contact devices F, F', comprising spring pressed plungers, of a segment I, arranged on the locomotive or car, a lever provided with a detent adapted to engage the notches of the rack, and cords or chains connecting the lever and the plungers of the contact devices, substantially as and for the purpose set forth.

3. An electric signal and switch operating apparatus, comprising the main track rails, a rail M, electrically connected with one of the main track rails, turnout rails or conductors U, U', a switch point or points, an armature lever connected with the switch point or points, an electro-magnet electrically connected with the rails or conductors U, U', and adapted when energized to attract and move the armature lever, a locomotive or car provided with contact devices F³, F⁴, adapted to engage the rails U, U', a contact device adapted to engage one of the main track rails, a contact device F², adapted to engage the rail M, an electrical signal E, and generator D, electrically connected with each other and with the contact device F², and the contact device which engages the main track rail, and a generator V, electrically connected with the contact devices F³, F⁴, all substantially as specified.

4. An electric signal apparatus comprising main track rails, a rail or conductor C, and a locomotive or car carrying a contact device adapted to engage the rail or conductor C, contact devices F, F', adapted to engage the main track rails and comprising spring pressed plungers, a segment I, a lever provided with a detent adapted to engage the segment, connections between the lever and the contact devices F, F', and an electrical signal E, and a generator D, connected with each other and with the contact device engaging the rail C, and the contact devices F, F', all substantially as specified.

5. An electric signal apparatus comprising main track rails, a rail or conductor C, a rail or conductor M, electrically connected with one of the main track rails and arranged adjacent to but insulated from the rail C, and a locomotive or car carrying a contact device adapted to engage the rail C, and the rail M, contact devices F, F', adapted to engage the main track rails, and an electrical signal E, and a generator D, connected with each other and with the contact device engaging the rails C, M, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

JUSTIN DUTREY.

Witnesses:

GABRIEL FERNANDEZ,
JOS. LAUTENSCHLAEGER.