

(No Model.)

C. A. SHEA.
TRAIN CONTROLLING DEVICE.

No. 578,298.

Patented Mar. 2, 1897.

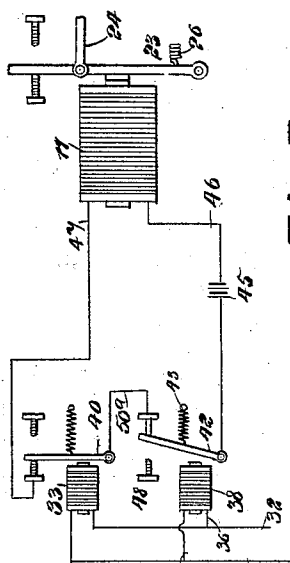


Fig. 2.

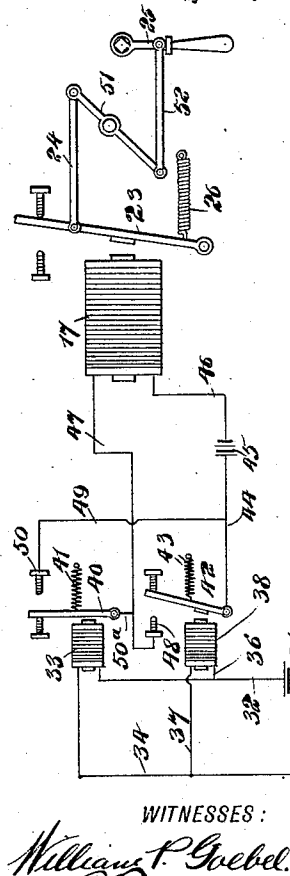


Fig. 3.

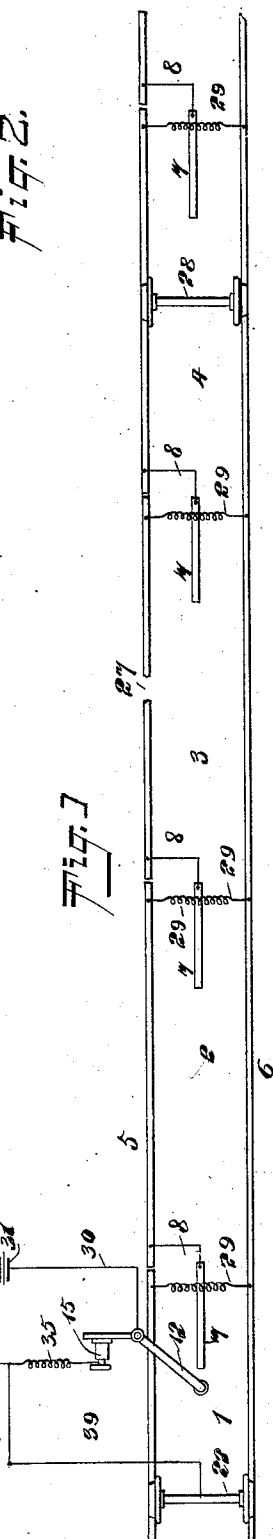
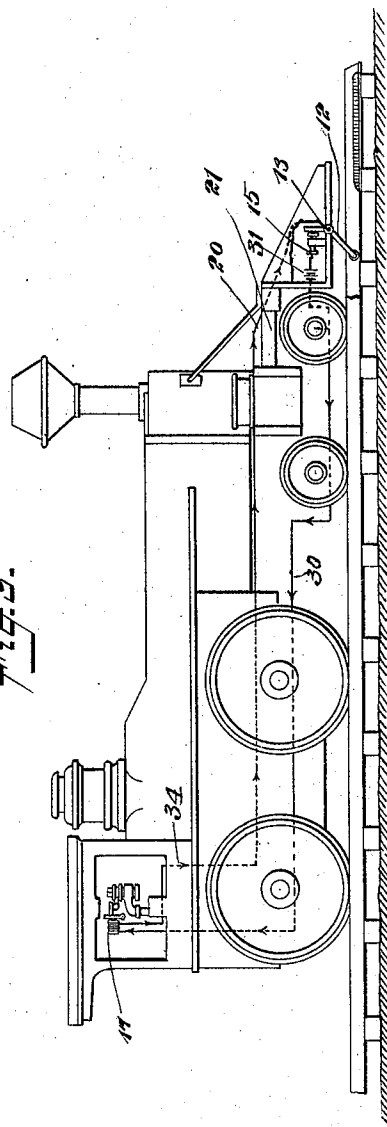


Fig. 4.



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TRAIN-CONTROLLING DEVICE.

SPECIFICATION forming part of Letters Patent No. 578,298, dated March 2, 1897.

Application filed October 14, 1896. Serial No. 608,817. (No model.)

To all whom it may concern:

Be it known that I, CHRISTOPHER A. SHEA, of Milton, in the county of Suffolk and State of Massachusetts, have invented a new and
5 Improved Train-Controlling Device, of which the following is a full, clear, and exact description.

This invention relates to a means for controlling the movements of a train, the said
10 means comprising electricity the circuit of which is automatically controlled to release certain brake-operating devices, whereby the brakes may be automatically set on a train
15 should there be danger on a portion of a track-section forward of the train.

I will describe a controlling device embodying my invention and then point out the novel features in the appended claims.

Reference is to be had to the accompanying
20 drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a diagrammatic view of a train-controlling device embodying my invention.
25 Fig. 2 shows a modification, and Fig. 3 shows the device as attached to a locomotive.

The invention comprises a track or railway laid out in block-sections 1 2 3 4, the rails 5
30 at one side of the track being disconnected at the ends of the section and the opposite rails 6 of the several sections being in electrical connection. At the end of each section between the rails 5 and 6 is arranged a
35 contact-rail 7, from which a wire 8 extends to the rail 5 of the section immediately in front, and each section-rail 5 at its forward end is connected to the rail 6 by means of a resistance-coil 29.

Arranged upon the forward end of the locomotive and preferably upon its cow-catcher
40 is a contact-lever 12, designed to engage at its lower end with the contact-rails 7. This lever 12 is pivoted on the shaft 13, and from this shaft 13 a contact-finger extends and is
45 adapted for engagement with a contact-piece 15, carried by the cow-catcher. From the contact-lever 12 a wire 30 extends to a train-battery 31 or other source of electricity conveniently located on the locomotive, and from
50 this battery 31 a wire 32 extends to an electromagnet 33, from which a wire 34, comprising

a resistance 35, extends to the contact-piece 15. Arranged in shunt-wires 36 and 37, leading from the wires 32 34, is an electromagnet 38, and from the wire 34 a wire 39
55 extends to the axle 22 of the locomotive.

Coacting with the electromagnet 33 is a pivoted armature-lever 40, having a retractile spring 41, and coacting with the electromagnet 38 is a pivoted armature 42, having a retractile spring 43. From the armature 42 a
60 wire 44 leads to one pole of a battery 45 or other source of electricity, and from the other pole of the same a wire 46 leads to an electromagnet 17, located on the locomotive, and
65 from this electromagnet 17 a wire 47 leads to a contact-piece 48, adapted to be engaged by the armature 42 when said armature 42 is held in engagement with the electromagnet
70 38. From the wire 44 a shunt 49 extends to a connection with a contact-piece 50, with which the armature-lever 40 is adapted to engage upon the deenergizing of the electromagnet 33, and a shunt-wire 50^a connects the
75 armature-lever 40 with the wire 47.

Coacting with the electromagnet 17 is an armature-lever 23, having a spring 26, and from this armature-lever 23 a link 24 extends
80 to a pivotal connection with one end of the fulcrum-bar 51, from the other end of which a link 52 extends to a connection with the valve-lever 25.

It will be seen that a current from the battery 31 normally flows through the electromagnets 33 and 38. The armature-lever 40
85 is held in engagement with the electromagnet 33 and the armature-lever 42 is held out of engagement with its electromagnet 38 by means of its spring 43. The resistance 35 in the battery-circuit equalizes the resistance 29
90 in the track section or circuit when the latter is looped in.

The electromagnet 17 is in an open circuit, and in operation as a train approaches the block or section 2 the contact-lever 12 will
95 ride upon the contact-rail 7 and loop in section 2, cutting out the train resistance 35. The section 2 being clear and safe, the electromagnets are not changed in any manner. At this time the current from the battery 31
100 will flow out on the rail 5 to the end of the section, then through the track resistance 29,

and back on the rail 6 of that section to the axle 22, the wire 39, and the electromagnets 33 and 38, back to the battery 31. Under this condition the train of course will proceed in safety. As the train approaches the section 3, which contains a broken rail, as at 27, the lever 12 will ride upon the contact-rail 7, looping or cutting in said section 3; but as the circuit is broken at 27 the battery 31 will meet an open circuit at this point, and consequently the electromagnet 33 will be deenergized and its armature-lever 40 will be drawn back by means of its spring 41 into engagement with the contact-piece 50, closing the circuit of the battery 45, which energizes the electromagnet 17, the armature of which will be attracted, and by drawing upon the link 24 will operate the valve-lever 25 and thus cause the operation of the brake.

I have described the operation in connection with danger from a broken rail in a section; but of course there are other sources of danger, such, for instance, as the standing or running of another train in the forward section. In the drawings I have indicated a train 28 in the section 4. When the train approaches the section 4, it will be automatically stopped, because of the train 28 in that section. The track resistance at the end of the section 4 will be short-circuited by the wheels of the train 28, and consequently the electromagnet 38 will receive an increase of current which will overcome the resistance of the spring 43 and pull the armature-lever 42 forward. This closes the circuit of the battery 45, and the electromagnet 17 is energized to operate the brakes. Instead of placing the electromagnet 17 in a normally open circuit, it may be placed in a normally closed circuit, as indicated in Fig. 2, in which event of course the contacts of the armature-levers 40 and 42 will be reversed.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In an automatic train-controlling device, the combination of a train-circuit consisting of a battery, a resistance and an electromagnet, a track-circuit consisting of the two rails of the track, resistance-coils connecting opposite rails, and a short auxiliary contact-rail connected to one of the track-rails, the contact-lever carried by the train and adapted to cut in the train-circuit through the track-cir-

cuit, and electromagnetic mechanism carried on the train and connected with the air-brake valve-lever, and adapted by the opening or short-circuiting of the train or track circuit to operate the brakes, substantially as specified.

2. In an automatic train-controlling device, the combination of a closed train-circuit consisting of a battery, a resistance and two electromagnets, one of which is operated by an increase of current and the other by a decrease of current, a track-circuit consisting of the two rails of the track, a resistance connecting opposite rails and a short auxiliary contact-rail connected to one of the track-rails, a contact-lever carried by the train and adapted to cut in the train-circuit through the track-circuit, and electromagnetic mechanism carried on the train and connected to the air-brake valve-lever and adapted by the opening or short-circuiting of the train or track-circuit to operate the brakes and stop the train, substantially as specified.

3. In an automatic train-controlling device, the combination of a train-circuit consisting of a source of electricity, a resistance, and electromagnetic mechanism operated by an increase of current and also by a decrease of current, a track-circuit consisting of the two rails of the track, a resistance connecting opposite rails, a short auxiliary contact-rail connected to one of the track-rails, a contact-lever carried by the train and adapted to cut in the train-circuit through the track-circuit, and an electromagnet on the train and connected with the air-brake valve-lever and adapted by the opening or short-circuiting of the train or track circuit to operate the brakes and stop the train, substantially as specified.

4. The combination herein described, of a closed train-circuit consisting of a battery, a resistance, and electromagnetic mechanism operated by an increase or a decrease of current, a track-circuit consisting of the rails of the track, a resistance connected thereto, and a contact-rail connected to one of the track-rails, and a contact-arm carried by the train and adapted to cut in the track-circuit through the train-circuit, substantially as specified.

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Witnesses:

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