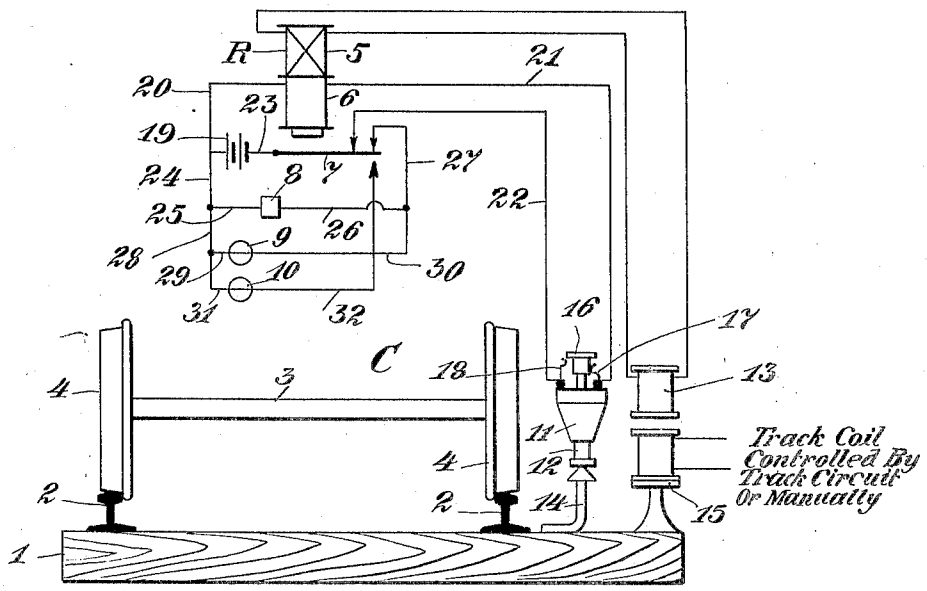
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AUTOMATIC TRAIN CONTROL

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UNITED STATES PATENT OFFICE.

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AUTOMATIC TRAIN CONTROL.

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To all whom it may concern:

Be it known that I, PAUL J. SIMMEN, a citizen of the United States, and a resident of the city of Buffalo, in the county of Erie and State of New York, have invented a new and useful Automatic Train Control, of which the following is a specification.

This invention relates to railways and particularly to the control of an electro-magnet on the cars or trains thereof, which electro-magnet may operate any suitable device for causing controlling of the train.

An important object of this invention is an arrangement and construction of train control including an electro-magnet upon the train, whereby one trackway element always acts to deenergize the electro-magnet if it is energized and another trackway element acts under one condition to energize the electro-magnet and under other conditions does not so act.

Other objects and advantages of the invention will appear as the description, hereinafter appearing, of the particular physical embodiment which has been selected to illustrate the principle of the invention, progresses, and the novel features of the invention will be particularly included in the claims hereto appended.

The invention consists in the combination and constructions, embodying the principle of the invention, and particularly described in the specification and pointed out in the claims for one particular physical embodiment of the invention.

In describing the principle of the invention, reference will be had to an illustrative physical embodiment illustrated by a single schematic view in the drawing forming a part of this specification, which drawing illustrates the invention as applied to a car.

In the drawing used for illustrating the particular physical embodiment of the principle of my invention an ordinary railroad tie is shown at 1. Mounted on this tie in the usual and ordinary manner are the rails 2.

A car is illustrated as being on the rails 2 by the showing of the ordinary axle 3 and the wheels 4.

The car, which is designated as a whole as C, carries a relay R, shown diagrammatically as double wound having a winding 5 and another winding 6.

The relay R has an armature 7, which may be used in any well known and approved manner for controlling the car. The armature is shown as controlling an air brake valve 8 and a green lamp 9 and a red lamp 10.

The car C supports in any suitable or appropriate manner the shoe bracket 11 carrying the vertically reciprocatable plunger 12, and also the coil 13 is carried by the car.

Mounted adjacent to the rail in any suitable or appropriate manner is a fixed ramp 14, as by mounting on the tie 1, and also a coil 15, as by mounting on the tie 1. The coil 15 may be called an inductor.

The coil 15 may be energized in any suitable or appropriate manner. On the drawing the legend indicates that the coil is energized by a control of a track circuit or manually in any appropriate manner.

If coil 15 is energized then when car C passes, a current is induced in coil 13 which may be called a receiver which energizes winding 5 of relay R and causes armature 7 to be raised to the position shown. This may be called the "pick-up" circuit.

The ramp 14 is so positioned that plunger 12 drops from its raised position, as shown in the drawing while the plunger is on ramp 14, to a lower position before relay R is removed from the effect of coil 15.

When plunger 12 drops, then the upper metallic button 16 of the plunger makes contact with both the springs 17 and 18, insulatingly mounted on shoe bracket 11, so that the armature 7 being raised a circuit is formed as follows: Positive side of battery 19, wire 20, coil 6 of relay R, wire 21, spring 17, metallic button 16, spring 18, wire 22, armature 7 and wire 23 back to the negative terminal of battery 19. This circuit maintains relay R energized even after coil 13 has moved away from the influence of coil 15 and so maintains armature 7 raised. This circuit may be called the "stick-up" circuit. As there is a "pick-up" circuit for relay R and a "stick-up" circuit for relay R, it is designated a "stick" relay in accordance with the usual nomenclature.

If the relay R is energized by the circuit through armature 7 and the car passes a ramp as 14 and a deenergized coil as 15 it will be readily seen that relay R will be deenergized and armature 7 will fall to remain down until the car C passes a coil 15 which is energized.

When armature 7 is raised a circuit is formed through air brake valve 8, preventing that valve from venting the train line

and applying the brakes, the circuit being as follows: positive side of battery 19, wires 24 and 25, valve 8, wires 26 and 27, armature 7 and wire 23 to the other terminal of the battery 19.

A circuit is also closed through green lamp 9 when armature 7 is raised as follows: positive side of battery 19, wires 24, 28 and 29, lamp 9, wires 30 and 27, armature 7 and wire 23 to the other side of the battery 19.

When armature 7 is in the lower position a circuit through the red lamp 10 is formed as follows; positive side of battery 19, wires 24, 28 and 31, lamp 10, wire 32, armature 7 and wire 23 to the other side of battery 19.

It will now be readily understood that under proper conditions, as clear conditions, the coil 15 will be energized. A car C passing will have its relay R energized or if it is energized, it will be maintained energized and lamp 9 will be lighted and the air brake valve 8 energized. These conditions will be maintained by the bridging of springs 17 and 18 by button 16 after the coil 13 is removed from the influence of coil 15.

It will further be understood that if car C passes coil 15 when proper conditions prevail, for instance, danger conditions, then coil 15 will be deenergized and consequently relay R will be deenergized by the contacting and raising of plunger 12 by ramp 14. This will cause the green lamp to be extinguished, the red lamp to be lighted and the air brake valve 8 to be deenergized setting the brakes on the car in the usual and well known manner.

It will further be understood that the relay R may be used as is well understood in the art for any purpose desired and for which it is appropriate, and that its deenergization is accomplished by mechanical means of a permanent and fixed nature and that its energization is accomplished by inductive means of a changeable nature and its continued energization is dependent upon a preliminary action of the inductive means and the subsequent action of train carried means.

Although one physical embodiment of the invention has been herein described and illustrated, it is desired to have it understood that the physical embodiment selected to illustrate the principle of the invention does not exhaust the possible tangible physical embodiments embodying the principle of the invention.

What is claimed as new and desired to secure by Letters Patent of the United States, is:

1. In a train controlling apparatus, in combination; a roadway; a car; a stick relay having a pick-up circuit and a stick-up circuit on the car; mechanical means on the road for breaking the stick-up circuit of said relay and electrical inductive means on the roadway for energizing the pick-up circuit of said relay.

2. In a train controlling apparatus, in combination; a roadway; a car; a stick relay on the car; mechanical means partly on the roadway and partly on the car for breaking the stick-up circuit of said relay; an electrical inductive means on the roadway for momentarily energizing the pick-up circuit of said relay and means including the mechanical means on the car for maintaining the stick-up circuit of said relay.

3. In a train controlling apparatus, in combination: a roadway; a car; a relay on the car; a "pick-up" circuit for the relay; a "stick-up" circuit for the relay; a mechanically operable circuit controller included in the "stick-up" circuit; a roadway device for mechanically operating the mechanically operable circuit controller; inductive means partly on the roadway and partly on the car for generating a "pick-up" current in the "pick-up" circuit and means governed by the relay for train control.

4. In a train controlling apparatus, in combination: a roadway; a car; a relay on the car including energizing coils and an armature; a circuit controller having a bias to closed position on the car; a device on the roadway for opening said circuit controller when mechanically contacted thereby; a source of current; a "stick-up" circuit including the source of current, the relay armature, the circuit controller and one winding of the relay, an energizable inductor on the track; a receiver on the car; a circuit including the receiver and another winding of the relay whereby a current is induced in the receiver by passing over the energized inductor and the relay is energized.

PAUL J. SIMMEN.