Jan. 2, 1923. 1,440,416

P. J. SIMMEN.
CAR SAFETY DEVICE.
FILED MAR. 10, 1919.

FIG. 1

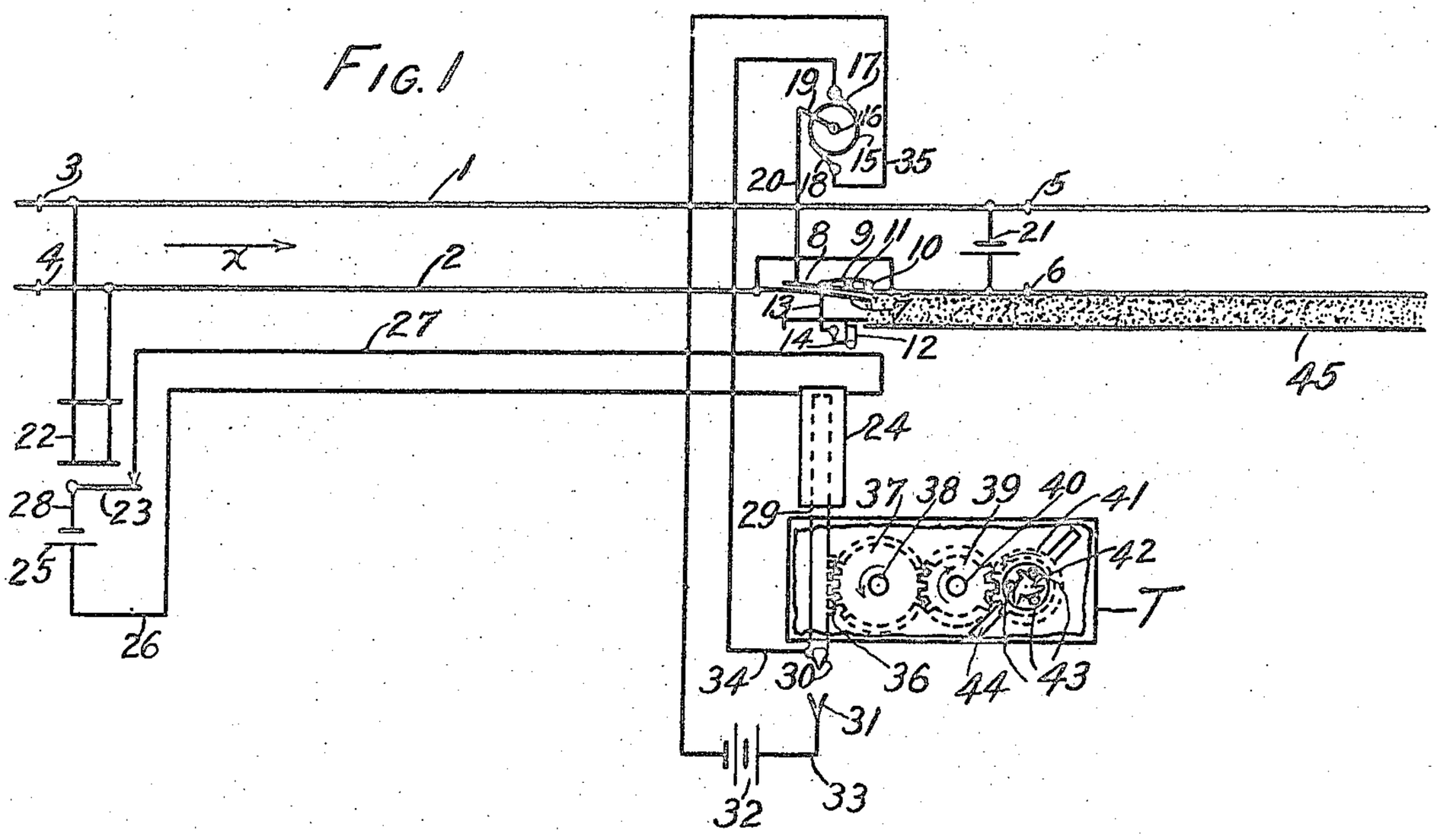
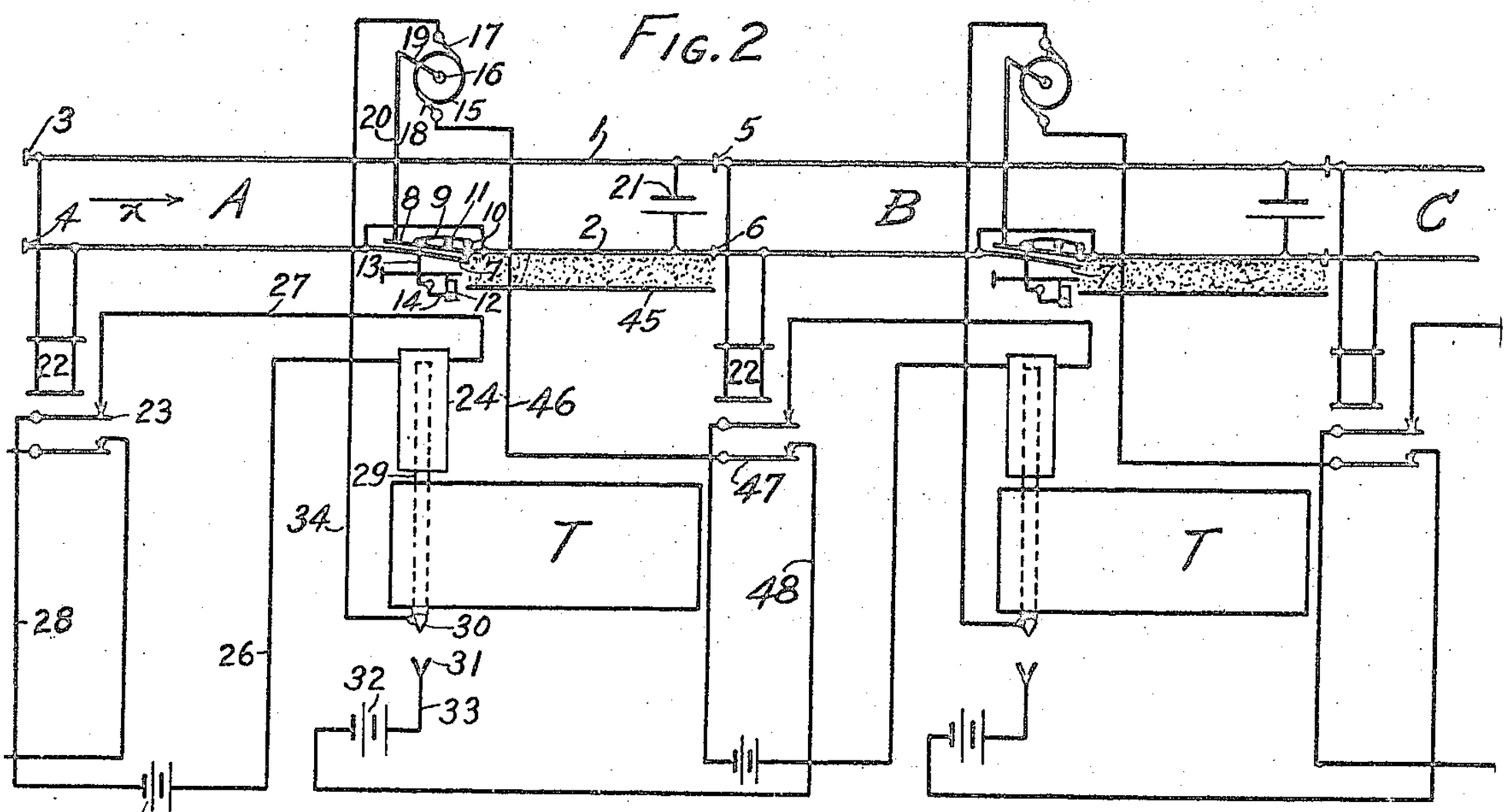


FIG. 2



Paul J. Simmen INVENTOR
BY
Lyman E. Dodge,
ATTORNEY

Patented Jan. 2, 1923. 1,440,416

UNITED STATES PATENT OFFICE.

PAUL J. SIMMEN, OF BUFFALO, NEW YORK.

CAR SAFETY DEVICE.

Application filed March 10, 1919. Serial No. 281,810.

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 Car Safety Device, of which the following is a specification.

This invention relates to derails, and particularly to derails which are automatically operated by an approaching car.

The primary object of my invention is to prevent a car from exceeding a safe speed.

Another object of my invention is to prevent one car from colliding with another car.

Other objects and advantages will appear in the following specification and the novel features of the device will be particularly pointed out in the appended claims.

In describing the invention in detail, reference is had to the accompanying drawing, wherein I have schematically illustrated a preferred physical embodiment of my invention, and wherein like characters of reference designate corresponding parts throughout the several views, and in which:—

Figure 1 is a schematic illustration of my device designed to prevent excessive speed; Fig. 2, is a schematic illustration of my device designed not only to prevent excessive speed but also prevent one car from colliding with another car.

On many of the railways of this and other countries cars are used which are not equipped with air brakes consequently the well known track trip cannot be employed to stop the car by opening the train pipe, nevertheless these cars are operated on tracks of very short curvature and steep downgrade and are operated by men who may through inexperience or inattention cause or allow the car to attain a dangerous speed. My device as shown schematically by Fig. 1 will prevent such excessive speed.

I have shown all parts both in Fig. 1 and in Fig. 2 schematically because I desire to have it well understood that no particular design of derail, signal, switch operating machine, delayed action device, relay or source of current is essential to my invention. Any of the well known forms of these devices now commonly used suitable for my purposes may be and are intended to be used. Furthermore no particular track construction is necessary for my invention because the principle may be applied by those skilled in the art to any suitable form.

In Fig. 1, 1 and 2 designate the two rails of a trackway, which is divided into electrically insulated sections by the insulating joints 3, 4, 5 and 6 in the well known manner using any of the well known and approved forms of such insulating joints.

To the track rail 2 I apply a derail, shown as a point derail, but any suitable form may be used which when in one position will derail a passing car and in another position will allow the car to pass safely. The derail which I have selected, and which is shown merely schematically, consists of a stock rail 7 and a movable point 8. In the figure it is shown in the open position, which is well understood and which as is well understood is the normal position of a derail as commonly used and as the open point faces the direction of traffic it is known as a "facing" derail. It is normally maintained in open position by any suitable or commonly used means such as a spring 9, one end of which is suitably attached to the movable point and the other end of which is suitably fastened to a suitable support as pin 10. In the form shown I have put the spring under tension by bending it over fixed pin 11.

To show whether the derail is open or closed I have for the purposes of illustration shown a signal 12, schematically, positioned just to the right of the derail as seen by an approcahing train it being understood, that in Fig. 1, the direction of traffic is in the direction of arrow X. For purposes of illustration I have connected a rod 13 to the derail to the other end of which is connected a pivoted right angle crank having its other arm connected by a rod 14 to the pivoted signal blade 12. This construction is intended to be such that when the derail is open the signal indication is danger but when the derail is closed the signal indication is clear.

I do not intend to limit myself to a signal connected directly to the derail but leave the selection of the signal and its mode of connection to the skill of those versed in this art, as it is well understood by those skilled in this art that for the purposes of this invention the signal need not be connected to the derail or in fact be dependent on it in any way, except to correspond with it in position.

In order to close the derail I preferably employ, and have schematically shown for the purposes of illustration, a motor 15, indicating the armature by 16 and one of the brushes by 17 and the other by 18 although of course by showing brushes I do not mean to exclude a brushless motor. The armature of the motor is connected by crank arm 19 in any suitable or appropriate manner; I have shown it directly connected, to link 20. The link 20 is connected to the derail. The construction is such that when current is applied to the motor the derail is closed.

Although I have shown the link 20 as acted upon by a compression force to close the derail I desire it understood that my invention is not confined thereto, because I do not intend to exclude a pulling force.

The circuit of the motor is normally open consequently the normal position of the derail is normally open in the form shown, but as is well known to those skilled in this art the derail might well be normally closed under such condition if the means used to open and close the circuit of the motor were suitably arranged although it is considered preferably practice to use a derail with such associated apparatus that it will be normally open.

In order to control the circuit of the motor I preferably employ a means operated upon by the car. The preferred form of this means includes the well known track circuit section which I have illustrated in the normally closed form, as that I believe is the preferable form.

21 is a source of current, shown as a battery, connected across the rails at one end of the section and 22 designates a relay, shown as a direct current relay connected across the rails at the other end of the section. That is, I have illustrated the end fed type of track circuit rather than the center fed, because somewhat simpler to show. As is well understood, a car passing insulating joint 3 and 4 moving in the direction of the arrow X would shunt relay 22 and cause its armature 23 to fall. Armature 23 controls a solenoid 24. The circuit is positive terminal of battery 25, wire 26, solenoid 24, wire 27, armature 23, and wire 28 to the negative terminal of the battery. While this circuit is formed solenoid 24 is energized and iron core 29 is held to the upper limit of its movement. The entrance of a car onto the track rails 1 and 2, however, deenergizes solenoid 24 and the core 29 is free to drop. The dropping of plunger 29 is not prevented but it is impeded, by a device to be hereinafter described, in such wise that a predetermined time elapses between the deenergization of solenoid 24 and the reaching of its lower position by core 29. When core 29 reaches its lower position its end 30 contacts with springs 31, so that a circuit is completed through the motor 15. This circuit is from the positive terminal of a source of current, shown as a battery 32, wire 33, springs 31, core tip 30, wire 34, to motor 15, through motor 15, shown as entering by brush 17 and leaving by brush 18, and wire 35 to the negative terminal of battery 32. The current flowing in the above traced circuit causes the motor to operate and close the derail.

I have stated that core 29 is impeded in its downward movement. I obtain this effect in any suitable or appropriate way now well known, but for the purposes of illustration I have shown a train of gears connected with a vane, the rotation of which in air causes considerable resistance to the movement of the gears. On the core 29 I may form integrally the teeth 36. The teeth 36 mesh with the teeth of gear wheel 37 journalled on shaft 38. The teeth on gear wheel 37 mesh with the teeth on gear wheel 39 journalled on shaft 40. The teeth on gear wheel 39 mesh with the teeth on annular gear wheel 41. Annular gear wheel 41 is mounted on what may be called a friction clutch consisting of a spider 42 and three balls 43. When plunger 29 is released by solenoid 24 and drops being made of such weight and by reason of its weight it turns gear wheel 41 in the direction of the arrow on the face thereof. This direction of movement causes the balls 43 to roll upon the arms of the spider 42 and clutch 41 and 42 together and so drive vane 44 which is attached to spider 43. This vane offers such resistance that the plunger 29 and the train of gears must move slowly and it will be arranged so that any predetermined time must elapse between the starting of the downward motion of plunger 29 and its contact with spring 31. If the solenoid is again energized the gears are rotated in the opposite direction and gear 41 rotates freely about spider 43 because when rotated in a direction opposite to that indicated by the arrow on the face thereof the balls as is evident and well understood do not clutch 41 and 42 together and so plunger 29 may rise almost instantly to its extreme upper position, and the parts may be of such light construction and so free from excessive friction that this is easily accomplished.

With such a construction as has been hereinbefore described if a car moving in the direction of arrow X passes insulating joints 3 and 4, the relay 22 will be deenergized, causing deenergization of solenoid 24. The plunger 29 will begin to fall but as it takes a predetermined time for core tip 30 to contact with springs 31 if the car is moving at too rapid a rate of speed it will reach derail 8 while it is open and the car will be

derailed, but if the car runs at the proper rate of speed then by the time it reaches derail 8, the core tip 30 will have contacted with springs 31, the motor circuit will have been closed and the derail closed so that the car may proceed without being derailed.

In order to bring the car when derailed to a stop properly and gently but still quickly I prefer to provide a rail or barrier parallel to rail 2 of the trackway and fill the intervening space with some suitable material such as sand which will greatly impede the onward movement of the carwheels but at the same time will not offer such a great resistance as will bring the car to a too abrupt stop. This barrier may be of any desired length as found proper in practice for specific local conditions to suitably guide the derailed car.

It will be thus seen that the devices and arrangements of Fig. 1 are such that they may be applied to a trackway in all conceivable situations and that even if a car is not equipped with air brakes it may be successfully stopped if it exceeds a predetermined speed, that is, passes over a fixed distance in too short a time. Not only may this arrangement be used with cars without air brakes but may also be used as an additional safety means in conjunction with the ordinary trips which apply the air brakes on cars which are equipped with air brakes.

In many situations it is not only desirable to prevent a car from exceeding a predetermined speed but it is also desirable to prevent a car from proceeding when a car is in too close proximity ahead. I accomplish this object by the means illustrated schematically by Fig. 2. I have illustrated my invention schematically because no particular apparatus is essential to my invention, any of the ordinary and well known apparatuses of suitable construction may be used.

In Fig. 2 I have shown two whole blocks or sections and a portion of a third, designated A, B, and C. The apparatuses used in the arrangement of Fig. 2 I have illustrated as identical with those of Fig. 1 so they may be given the same designating numerals, but the circuit arrangement is different for the motor circuit, because instead of having the circuit of motor 15 depend entirely on plunger 29, I have it also depend upon the armature of the track relay in the section in advance. The circuit of motor 15 in section A will therefore be as follows: positive terminal of battery 32, wire 33, tip 30, wire 34, motor 15, wire 46, armature 47 of relay 22, and wire 48 to the negative terminal of battery 32. The result is that if a car passes the insulating joints 3 and 4 moving in the direction of arrow X it will deenergize relay 22 and so deenergize solenoid 24 and cause core tip 30 to fall into contact with springs 31 only after a predetermined time, by reason of the device indicated generally by T in both figures, so that if the car is travelling at too great a speed it will be derailed because when it reaches the derail it will find it open. Even if the car is travelling at the proper speed before and at the time it reaches derail 8 it will still find the derail open if a car is in section B, because with a car in section B the relay 22 of that section is deenergized and its armature 47 in the lower position so that even if 30 makes contact with 31 the circuit of the motor will still be open at armature 47 so that the derail will still be open.

This construction and arrangement as shown schematically by Fig. 2 thus provides not only for excessive speed but also provides a means for preventing collisions.

Although I have particularly described the construction of one physical embodiment of my invention and explained the operation and principle thereof; nevertheless, I desire to have it understood that the form selected is merely illustrative, but does not exhaust the possible physical embodiments of the idea of means underlying my invention.

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

1. In a device for securing safety in car movements, in combination: a trackway; a car; a movable derail in the trackway; means for indicating the position of the derail; a time interval device; means operated by the car for starting the time interval device in operation and means controlled by the time interval device at the expiration of its time interval for moving the derail to allow passage of the car over the derail.

2. In a device for securing safety in car movements, in combination: a trackway; means forming a track circuit section in said trackway including a source of current and a translating device; a time interval device controlled by the translating device and a derail in the trackway controlled by the time interval device.

3. In a device for securing safety in car movements, in combination: a trackway; a car; a second car; means for derailing the first said car if it consumes less than a predetermined time in moving from a certain point in the trackway to another certain point in the trackway or if the second mentioned car is within a given section of the trackway.

4. In a device for securing safety in car movements, in combination: a trackway; a first car; a second car; means controlled by the second car for derailing the first car if the first car is operated by a certain point in the trackway while the second car is occupying a certain section of the trackway.

5. In a device for securing safety in car movements, in combination: a trackway divided into track circuit sections each includ-

ing a translating device and a source of current: a derail in the trackway in each section; a time interval device associated with each section each time interval device being governed by the translating device of the section with which it is associated; means governed by the time interval device of one section and the translating device of another section for controlling the derail of the section with which the time interval device is associated.

6. In a device for securing safety in car movements, in combination: a trackway divided into track circuit sections each including a source of current and a translating device; means controlled by the translating devices to derail a car if it exceeds a predetermined speed in passing from one certain point to another in the trackway.

7. In a device for securing safety in car movements, in combination: a trackway divided into track circuit sections each including a source of current and a translating device; means controlled by the translating devices to derail a car if it exceeds a predetermined speed in passing from one certain point to another in the trackway or if another car occupies a given section of the trackway.

8. In a device for securing safety in car movements, in combination: a trackway; a car; means for derailing the car if it consumes less than a predetermined time in moving from a certain point in the trackway to another certain point in the trackway and means for receiving and guiding and impeding the further movement of the car.

PAUL J. SIMMEN.