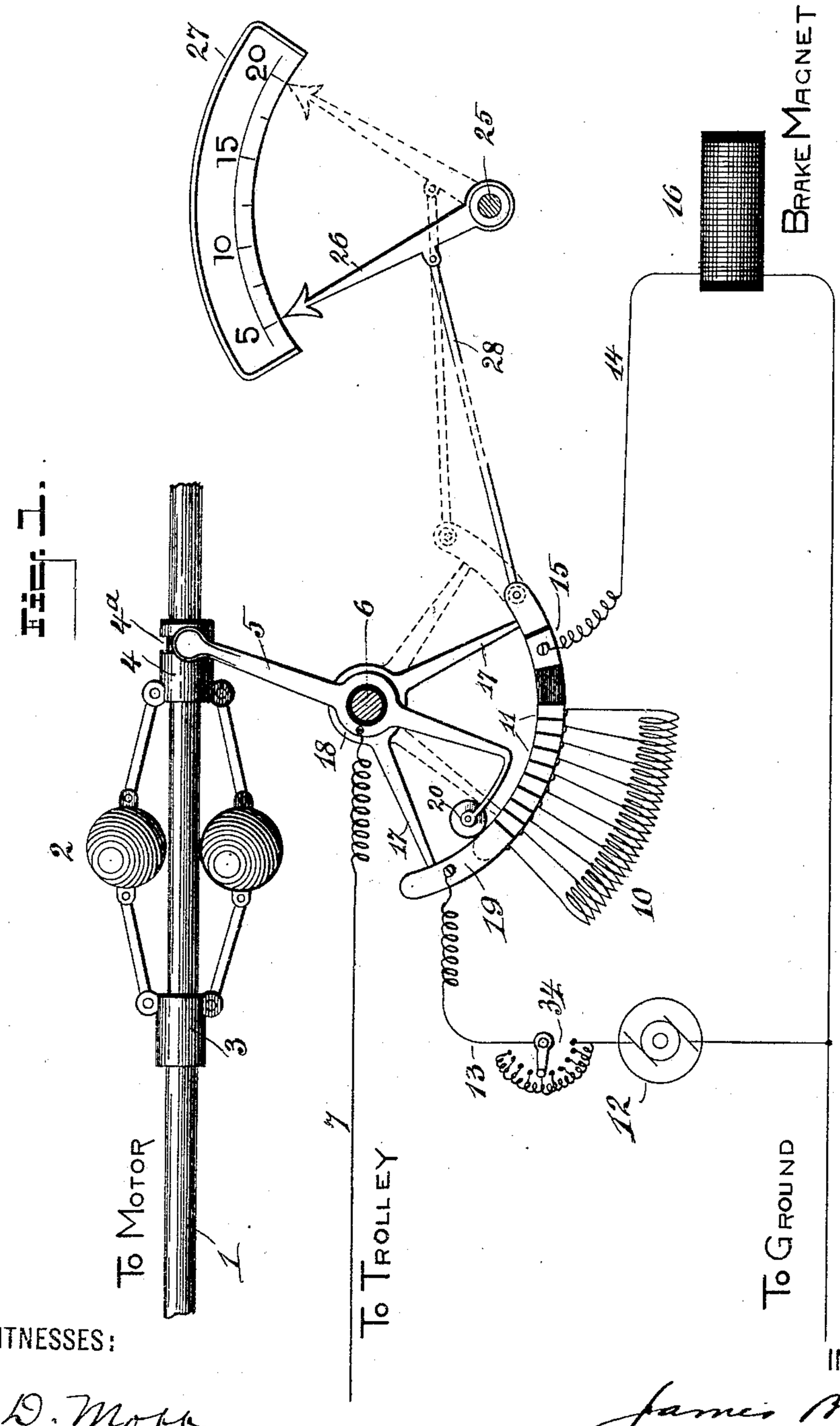
(No Model.) 2 Sheets—Sheet 1.

J. BRADY.

DEVICE FOR CONTROLLING SPEED OF ELECTRIC CARS.

No. 547,369. Patented Oct. 1, 1895.

Fig. 1.



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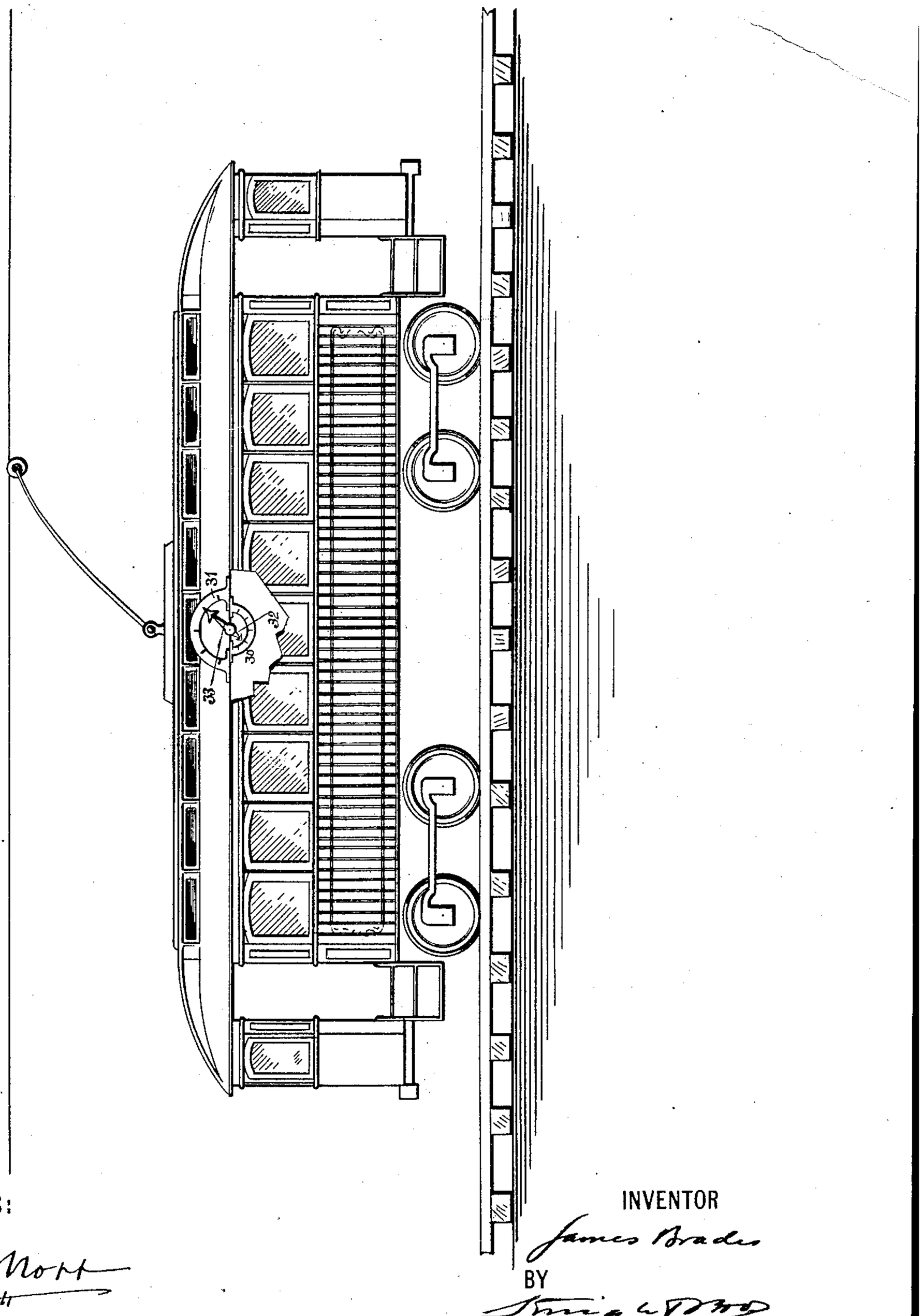

FIG. 1.

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DEVICE FOR CONTROLLING SPEED OF ELECTRIC CARS.

SPECIFICATION forming part of Letters Patent No. 547,369, dated October 1, 1895.

Application filed June 24, 1895. Serial No. 553,841. (No model.)

To all whom it may concern:

Be it known that I, JAMES BRADY, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Devices for Controlling the Speed of Electric Cars, of which the following is a specification.

The object of my invention is to provide a simple and effective device for controlling the speed of electric cars, in order that railway companies can confine the speed of their cars to certain rates within certain districts, as required by the ordinances of large cities, and also to enable them to run their cars on time.

To this end my invention consists, essentially, of a speed-governor geared to the motor or its driven shaft or axle in any suitable way and controlling a movable contact which is included in the motor-circuit and is adapted to throw the motor out of circuit or throw into circuit additional resistances for regulating the speed of the motor. It is preferable to provide a shunt-circuit including a magnet which controls suitable braking mechanism, said shunt-circuit being thrown into the main circuit after a certain amount of resistance has been brought into circuit or after the motor has been cut out. I also provide one or more indicators, preferably three, one being on the inside of the car in view of the conductor and passengers and the other two being on the outside of the car (one on each side) in view of the public, for indicating the limit of speed at which a car is being run. It is preferable to group the several contacts of the resistances and the shunt-circuit into a movable series and provide means whereby said series of contacts can be shifted with relation to the movable contact-arm under the control of the speed-governor, so that said resistances and shunt-circuit can be brought into circuit for different rates of speed.

In order that my invention may be fully understood, I will first describe the same in reference to the accompanying drawings, and afterward point out with more particularity the novel features in the claims.

In said drawings, Figure I is a diagrammatic elevation representing the essential parts of my invention. Fig. II is a side elevation of an electric car, showing the two indicators.

1 is a rotatable shaft geared to the motor in any suitable way and located in any convenient position upon the running-gear of the car.

2 is an ordinary ball-governor mounted upon the shaft 1 and having the rigid collar 3 and sliding collar 4.

5 is a pivoted contact-arm pivotally mounted upon the shaft 6 and insulated therefrom and communicating through the wire 7 with the trolley. The arm 5 has a lug at its upper end which bears in the groove 4^a on the movable collar 4 on the speed-governor, whereby movement of the sleeve 4 will operate the arm 5.

10 represents a series of resistance-coils having contact-blocks 11.

12 is the motor, and 13 is the circuit-wire leading from the resistance-coils to the motor, the circuit passing from the motor to the ground.

14 is a shunt-circuit having the contact-block 15.

16 is a brake-magnet controlling any suitable form of braking mechanism.

The contact-blocks 11 and 15 are preferably arranged together in the form of a segment and suitably connected through the arms 17 to a central bearing 18, which is journaled upon and insulated from the shaft 6.

19 is a part of the contact insulated from the blocks 11 and 15, to which the circuit-wire 13 is attached.

20 is a contact-roller journaled in the lower spring end of the pivoted contact-arm 5 and resting normally upon the contact 19 to form a complete circuit from wire 7 through the trolley-arm 5, roller 20, contact 19, wire 13, and motor 12.

25 is a suitable rock-shaft journaled in bearings in any desired position in the car and preferably to the top part of the car.

26 is an indicator-arm keyed to the shaft 25 and adapted to register with the scale 27. The indicator 26 is connected through link 28 with the arm 17 of the segment of contact-blocks, the position of the indicator representing the relative positions of the series of contact-blocks and the movable contact-arm, and

consequently the maximum rate of speed which the car will be allowed to run before being checked by cutting out the motor or bringing into circuit resistance-coils or braking mechanism. The rock-shaft 25 may be shifted to change the rate at which a car will be allowed to run by any suitable hand-operating mechanism—such, for instance, as a hand-lever keyed to said shaft.

In Fig. II, I have shown a dial 30 within the car and a dial 31 on the roof or side of the car, the pointers 32 and 33 being keyed to the rock-shaft in suitable position to register with these dials, respectively, for indicating the rate of speed of the car both to the passengers and the outside public.

Although I have described my controlling device for controlling the speed of electric cars, it will be obvious that it is equally as useful for controlling the speed of motors in other connection, and I do not desire to limit myself to the particular application described.

The operation of the device will be clear from the above description. When the speed of the motor becomes greater than desired, the contact-roller 20 will be shifted from the contact 19 to the contact-blocks 11 for throwing in the several resistance-coils, and should this additional resistance be insufficient to check the speed to the required rate the contact-arm will be shifted further by the speed-governor 2 and finally cut out the motor altogether. If this should not be sufficient, a further movement of the contact-arm by means of increased speed will bring into circuit the braking mechanism.

My improved controlling device will be automatically thrown into operation for braking cars going down hill when the speed becomes too great, and in fact will be found to be very valuable in many instances for controlling the speed of the cars and preventing the car getting up to an unsafe momentum.

At 34 I have shown diagrammatically the usual switch or lever for controlling the motor, either by operating a rheostat or by changing the resistance of the motor itself by changing the coupling of its field-magnet coils or by cutting out the motor entirely. It will be observed that whatever the position of switch or rheostat-lever 34 the brake-magnet 16 will be affected by an increase of the speed of the car beyond the predetermined limit. For example, should the car be running down hill with the motor 12 cut out, the increase of the speed of the car to the predetermined limit will cut in the brake-magnet 16.

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

1. In a device for controlling the speed of electric motors, the combination of a speed governor having operating connection with the motor or its driven shaft or axle, a manually adjustable device operated by said governor and adapted to automatically regulate the flow of current through the motor, and an indicator suitably connected to the current regulating device and adapted to be moved only by the manual adjustment thereof to indicate the rate of speed to which the motor is regulated or confined, substantially as set forth.

2. In a device for controlling the speed of electric motors, the combination of a speed governor having operating connection with the motor or its driven shaft or axle, a movable contact controlled by said governor and adapted to automatically cut out the motor, a shunt circuit through which the current is short circuited, and a magnet included in said shunt circuit for operating suitable brake mechanism, substantially as set forth.

3. In a device for controlling the speed of electric motors, the combination of a speed governor having operating connection with the motor or its driven shaft or axle, a movable contact controlled by said governor and included in the motor circuit, a shunt circuit, and means for regulating the action of the movable contact, whereby the motor may be automatically cut out at any desired rate of speed, substantially as set forth.

4. In a device for controlling the speed of electric motors, the combination of a speed governor geared to the motor or its driven shaft or axle, a movable contact controlled by said governor and adapted to automatically cut out the motor, means for regulating the action of the movable contact for cutting out the motor at any desired rate of speed, and an indicator suitably connected to the regulating means for indicating the speed at which the motor will be cut out, substantially as set forth.

5. In a device for controlling the speed of electric motors, the combination of the resistances, a speed governor geared to the motor or its driven shaft or axle, a movable contact controlled by said speed governor for throwing the several resistances into and out of circuit, means for adjusting the relative positions of the movable contact and the resistances, and an indicator suitably connected to said adjusting means for indicating the speed at which the motor will be automatically controlled, and which it cannot exceed, substantially as set forth.

6. In a device for controlling the speed of electric motors, the combination of a series of resistance coils, a shunt circuit, a magnet controlling suitable brake mechanism included in the shunt circuit, contacts at the open ends of said resistance coils and shunt circuit, a movable contact included in the motor circuit and adapted to contact with the resistance and shunt contacts for automatically throwing the resistance coils and shunt into and out of circuit, and a speed governor geared to the motor or its driven shaft or axle and controlling said movable contact, substantially as set forth.

7. In a motor controlling device, the combination of a series of resistance coils, a shunt circuit, a magnet controlling suitable braking mechanism included in said shunt circuit, a movable series of contacts at the open ends of the resistance coils and shunt circuit, a movable arm carrying a contact adapted to contact with said movable contacts for including the resistance coils or shunt in the circuit, a speed governor geared to the motor or its driven shaft or axle and controlling said movable arm, means for shifting the movable contacts, and an indicator, substantially as set forth.

8. In a motor controlling device, the combination of a speed governor geared to the motor or its driven shaft or axle, a pivoted arm engaged by the movable part of said governor and carrying an electric contact and included in the motor circuit, a segment of contact blocks journaled upon the same center as the contact arm, a series of resistance coils and a shunt circuit connected to said contact blocks, a brake magnet included in the shunt circuit, and a pivoted index connected to the segment of contact blocks to indicate their position with relation to the pivoted contact arm, substantially as set forth.

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