(No Model.)

W. N. JONES, Jr.

ELECTRIC REGULATOR AND SWITCH.

No. 508,322. Patented Nov. 7, 1893.

Fig. 1.

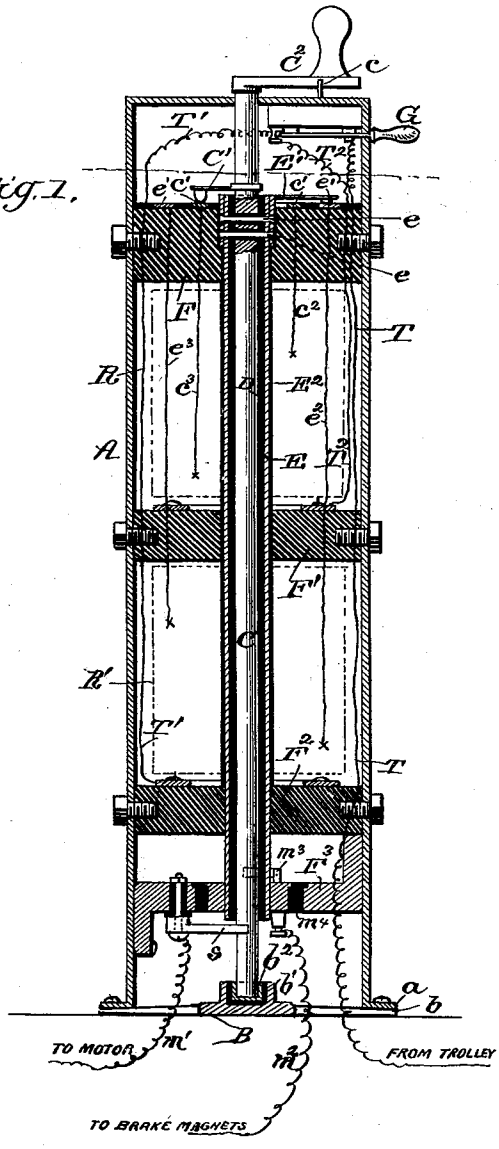


Fig. 2.

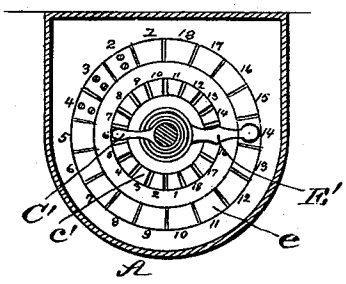


Fig. 3.

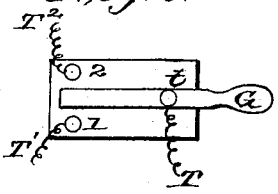
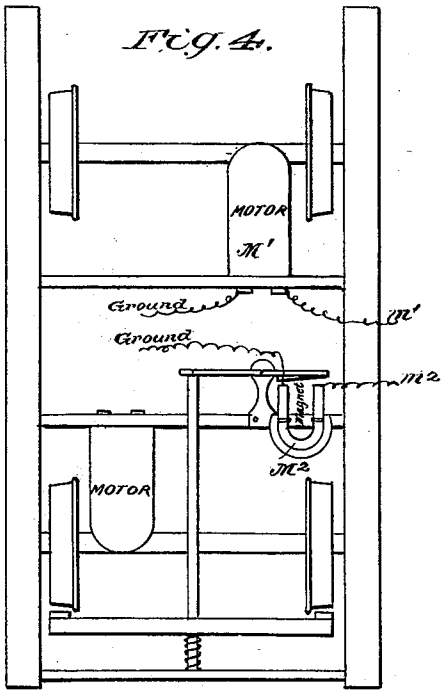


Fig. 4.



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ELECTRIC REGULATOR AND SWITCH.

SPECIFICATION forming part of Letters Patent No. 508,322, dated November 7, 1893.

Application filed July 20, 1893. Serial No. 481,021. (No model.)

To all whom it may concern:

Be it known that I, WALTER N. JONES, Jr., of Petersburg, in the county of Dinwiddie and State of Virginia, have invented a new and useful Improvement in Electric Regulators and Switches, of which the following is a specification.

The object of my invention is to provide a simple and compact electric regulator and switch, for use on electric cars, &c., in which the same adjusting devices serve to regulate the current to both the motor and the brake magnets, without allowing the current to be on the motor and brake magnet at the same time by reason of any inattention or forgetfulness of the motor man.

To this end my improvements consist in the peculiar construction and arrangement of the regulating devices, and their combination with a separate and independent switch, which I will now proceed to describe with reference to the drawings in which—

Figure 1 is a vertical longitudinal central section of the regulating devices. Fig. 2 is a plan view of the same with the top removed. Fig. 3 is a detail of the switch, and Fig. 4 is a plan view of the arrangement of the motors and brake magnets shown in relation to the running gear of the car.

In the drawings A represents the case or housing of the regulator, which at its lower end is provided with a flange *a* by which it may be screwed or bolted to the car floor. At the bottom part of the case, and held in place by the same screws or bolts which secure the flange *a* of the casing there is a spider frame B having a central step bearing b' containing a brass cup b^2 which is insulated from the frame by a lining of vulcanite or other insulating material. Within this cup is stepped or journaled the lower end of a central vertical metal shaft C, which extends through the top of the case and is provided with a crank handle C^2 whose throw is limited by a pin *c* on the top of the case. This shaft C turns in the top of the case, and also in the non-conducting partitions F F' F^2 and bottom plate F^3. Said shaft is surrounded with a non-conducting sleeve D of vulcanite or hard rubber, and outside of this carries a tube E of brass covered in turn by another non-conducting sleeve E^2. The brass tube E is rigidly connected to the shaft C by pins *e e* which are insulated from the shaft C by thimbles of vulcanite or hard rubber.

In the compartment between the partitions F and F' is placed a rheostat R (shown in dotted lines) for the motor, and in the compartment between partitions F' F^2 is placed another rheostat R' (also shown in dotted lines) for the brake magnets. The rheostat R is connected by a series of wires c^2 c^3 with a corresponding series of segmental metal plates c' set in a circle on top of non-conducting partitions F, and on these segmental plates is arranged to rotate a spring contact arm C' fixed to the shaft C. The rheostat R' is connected by a series of wires e^2 e^3 to a similar series of segmental metal plates e', set in a large circle concentric with c', on the top of the non-conducting partition F. Upon this series of plates there is arranged to rotate a spring contact arm E' which is connected to the metal tube E carried by the shaft C in insulated relation thereto. The wires c^2 c^3 and e^2 e^3 of the two rheostats connect with the rheostats at different points along the coils of the same as usual, so that in either rheostat a current passing through one of these wires and segmental plates traverses a greater or less portion of the coil than any other plate and wire of the same series. Each series of plates c' and e' progresses in increasing efficiency, but the two series increase in opposite directions to each other as shown in Fig. 2. As shown the inner series of plates are intended for the motor, and the outer one for the brake magnets, but these can be reversed if desired.

G, Fig. 3, is a switch. This is fulcrumed at *t* in the upper part of the case, and its handle portion protrudes through a slot in the case, while its other end plays alternately upon the two contacts 1 and 2. The current from the trolley comes in at the wire T and goes to the fulcrum *t* of the switch, and thence down the wire T' or T^2 according to whether it is directed to the motor or the brake magnets. If it descends wire T', it goes to the brake rheostat R' through a greater or less portion of its coil, to one of the series of plates e', thence through arm E' down metal tube E

to a spring or brush m^3 on an insulating bushing m^4, and thence by wire m^2 to the brake magnets M^2, shown in Fig. 4, and thence through the magnets to the ground by way of the wheels of the car. If the current descends wire T^2 from the switch, it goes to the motor rheostat R through a greater or less portion of its coils to one of the series of plates c', thence through arm C′ to shaft C, down shaft C to the insulated contact spring or brush s, thence by wire m' to the motor, Fig. 4, and thence to the ground through the car wheels.

From the foregoing description it will be seen that the current is alternately thrown by the switch G through the motor and brake magnets, but never through both at the same time, and hence there is no loss of electric energy. While this is so, however, the same regulating devices serve to transmit a greater or less portion of the current either to the motor or the brake, the power increasing in the motor by the movement of crank C′ in one direction, and the power increasing in the brake by the mere reversal of the movement of the crank.

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

1. An electric regulator and switch, consisting of two series of segmental plates, two rheostats connected to the series of plates as described to give an increasing power in one series of plates in one direction, and an increasing power in the other series of plates in the opposite direction, a central shaft with contact arm playing over one series of plates, an insulated tube carried by said shaft and provided with a contact arm playing over the other series of plates, an independent switch for throwing the current alternately to either rheostat, and connections for taking of such current and directing it either to the motor or brake magnets substantially as shown and described.

2. In a regulator and switch for electric cars, the combination of two concentric rheostats, two concentric series of segmental plates leading thereto, a central shaft with insulated metal tubes bearing separate contact arms playing respectively upon the series of plates, the said central shaft and metal tube forming two independent paths for the current centrally through the rheostats substantially as shown and described.

3. The combination of case A having partitions F F′ F^2, the central shaft C having contact arm C′ and provided with insulating sleeves D and E^2, the metal tube E arranged between the insulating sleeves and bearing contact arm E′, the rheostats R and R′, the two reversed series of metal plates c' e' connecting with the rheostats, the independent switch G with two-point contacts for the two rheostats, and brushes or contact springs for taking off the current from the central shaft and insulated tube substantially as shown and described.

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