

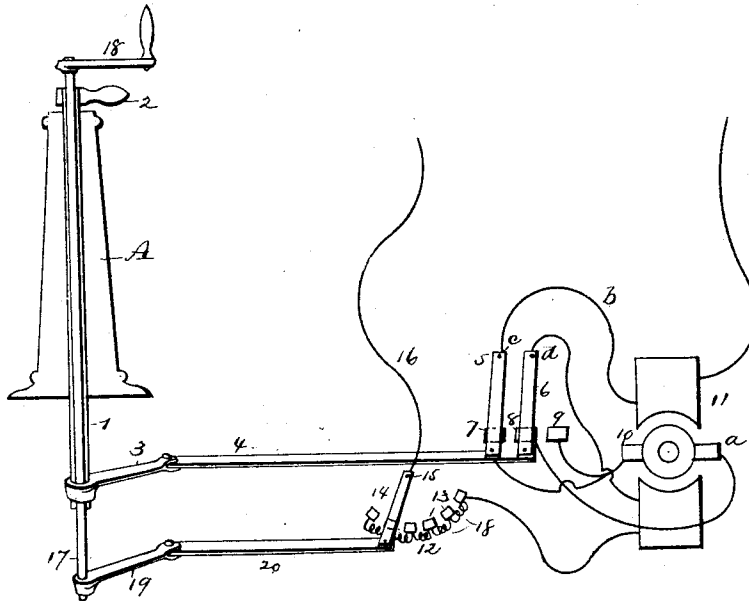
(No Model.)

S. H. SHORT.

MOTOR CONTROLLING DEVICE FOR ELECTRIC LOCOMOTIVES.

No. 514,135.

Patented Feb. 6, 1894.



Witnesses
G. F. Downing.

Inventor
S. H. Short
By his Attorney
H. A. Seymour

UNITED STATES PATENT OFFICE.

SIDNEY H. SHORT, OF CLEVELAND, OHIO, ASSIGNOR TO THE SHORT ELECTRIC RAILWAY COMPANY, OF SAME PLACE.

MOTOR-CONTROLLING DEVICE FOR ELECTRIC LOCOMOTIVES.

SPECIFICATION forming part of Letters Patent No. 514,135, dated February 6, 1894.

Application filed January 6, 1890. Serial No. 336,004. (No model.)

To all whom it may concern:

Be it known that I, SIDNEY H. SHORT, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Devices for Controlling Railway-Motors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in devices for controlling the motors of electric cars, its object being to produce means for varying the speed and changing the direction of rotation of the motor.

With this object in view the invention consists in two operating shafts, and switches connected therewith for reversing the motion or rotation of the motor and varying its speed.

The accompanying drawing represents a diagrammatic view illustrating one embodiment of my invention.

A represents a hollow post or stand adapted to be secured upon the platform of a car or such other place from which it is desired to control the motor. Mounted in this post is a hollow shaft 1, which extends at its ends beyond the top and bottom of the post A, being provided at its top with an operating arm or lever 2. To the lower extremity of the hollow shaft 1 a crank arm 3, is secured, to the outer end of which is pivoted one end of a reciprocating bar 4. Two switch levers 5, 6, are pivoted at one end to the bar 4, the opposite ends of said switch levers being pivoted at *c*, *d*, to some stationary object attached to the car. Three contact blocks 7, 8, 9, are provided, with which the switch levers 5, 6, are adapted to make contact. The contact blocks 7 and 9 are connected with one commutator brush 10 of a motor 11, and the contact block 8 is electrically connected with the other commutator brush *a*, of the motor. One end *b* of the helix of one field magnet of the motor is connected, by means of a suitable wire, with the switch lever 5, while the opposite extremity of said helix is connected with the line. The switch lever 6 has attached to it one end of the helix of the other field magnet of the motor, the opposite end of this helix being con-

nected to one end of a variable resistance 12 which latter may consist of a series of resistance coils 13, the opposite ends of which are attached to a series of contact blocks 13. A switch lever 14 is pivoted at 15 and adapted to be moved over and make contact with the blocks 13,—a wire 16 connecting this switch lever with the line.

Passing through the hollow shaft 1 and mounted to rotate therein, is a shaft 17, which extends beyond the hollow shaft at both ends, and is provided at its upper end with a hand lever 18, by which to rotate it. At the lower extremity of the shaft 17 a crank arm 19 is secured, the free end of which is pivotally united to one end of the reciprocating bar 20, the latter having the switch lever 14 pivoted thereto. Thus it will be seen that by operating the hand lever 18 the switch lever 14 will be moved over the contact blocks 13, and more or less of the variable resistance 12 may be included in the circuit with the motor.

Assuming that the switch levers 5, 6, are in contact with the blocks 7, 8,—the circuit from the line wire will flow through one field magnet of the motor, thence to switch lever 5, to contact block 7, thence to the commutator brush 10 of the motor,—from the other commutator brush *a* to contact block 8, through switch lever 6 to and through the helix of the field magnet,—from thence the current passes to the variable resistance and finally to the line by the switch lever 14 and wire 16. If now, it be desired to change the direction of rotation of the motor, the hand lever 2 will be operated to shift the positions of the switch levers 5, 6,—the lever 5 now engaging contact block 8 and the lever 6 making contact with block 9. Under these conditions, the current, instead of flowing from the contact block 7 to the commutator brush 10 as above explained, will now flow from the contact block 8 to the commutator brush *a*, and from the commutator brush 10 to contact block 9 and thence through the remainder of the circuit as before. Thus the current will enter and pass through the motor armature in the reverse direction and the rotation of the motor will thereby be reversed.

When it is desired to increase or diminish

the speed of the motor, the hand lever 18 will be operated to cause the switch lever 14 to pass over the contact blocks 13 of the variable resistance and thus more or less of said resistance will be switched into circuit accordingly as it is desired to increase or diminish the amount of current to be allowed to pass through the motor.

With the devices and circuits arranged as above described, a very simple and compact apparatus is provided for regulating the speed and changing the direction of rotation of the motor, and the devices for accomplishing both of these objects are placed in close proximity to each other and adapted to be readily operated by one operator.

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

The combination with the hollow post or stand, shafts 1 and 17 mounted in said post and crank arm 3 secured to the lower end of shaft 1 and crank arm 19 secured to the lower end of shaft 17, of an electro-motor, a reversing switch, rheostat, rod 4 pivoted at one end to crank arm 3, and at its opposite end pivoted to the movable contacts 5 and 6 of the reversing switch and rod 20 pivoted at one end to crank arm 19 and at its opposite end to the free end of the movable contact 14 of the rheostat, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

SIDNEY H. SHORT.

Witnesses:

A. B. CALHOUN,
JOHN C. DOLPH.